INSTRUCTION BOOK
Memo-Matic*

automatic punchcard knitter

with Motif-Maker

Model 324-326

by SINGER

Before starting to knit, you should understand that ...

This knitting machine has been designed and manufactured for the use mainly at home. The machine is provided with various functions that are useful for knitting garments in various way for yourself and family. But it is requested to use knitting yarns suitable for the machine, and to operate the machine in a proper manner as described in this instruction book.

When this home-use knitting machine is used for mass-production of knitted garments, special cares should be taken to knit at the proper speed, and to knit with yarns that are suitable for the selected stitch type on the knitting machine.

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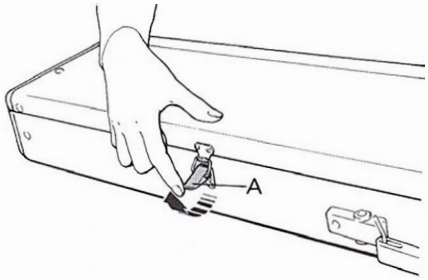
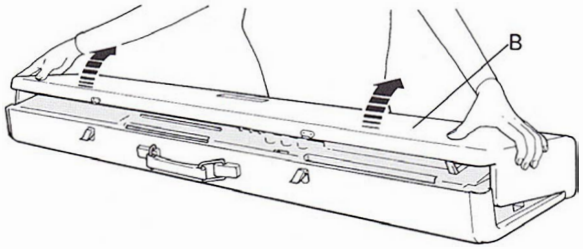
MACHINE AND ACCESSORIES



Machine

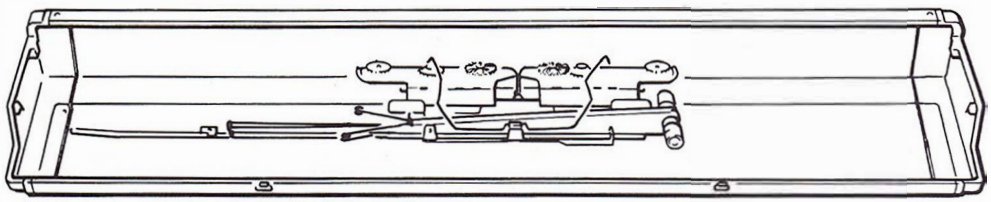
Place the Knitter on the table with Carrying Handle away from you.

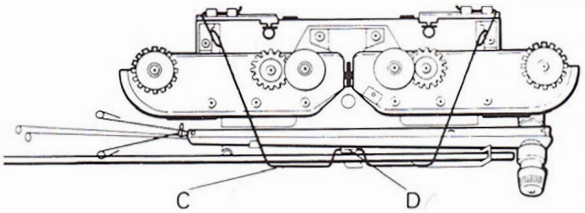
Unfasten the Latches "A".



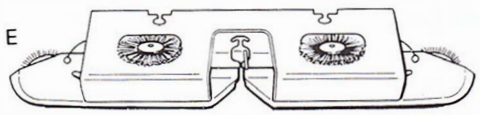
Lift the Top Cover "B" slightly. Pull the cover towards you to remove it from the Knitter.

Place the Top Cover as shown below.

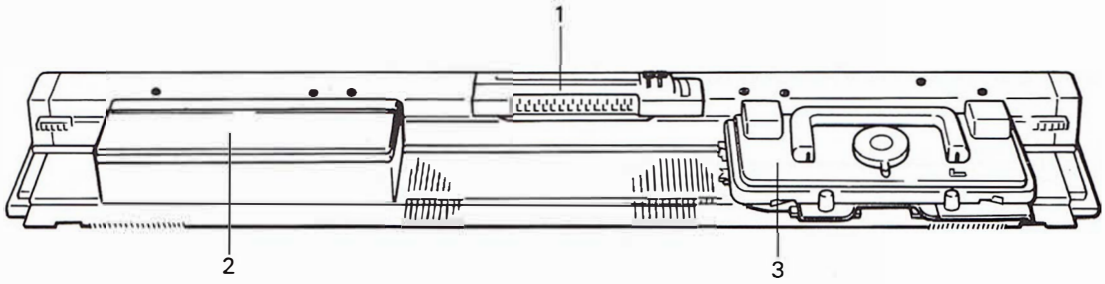


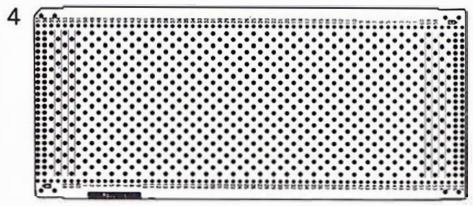


Release the wire spring "C" from the holding bracket "D" inside the Top Cover.



E — Arm
F — Yarn Rod
G — Auto Tens'on



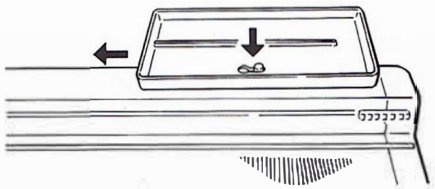


1. Pattern Panel
2. Accessory Box
3. Carriage
4. Punch Card (20)

* Instruction Book
* Pattern Book

Accessory Box

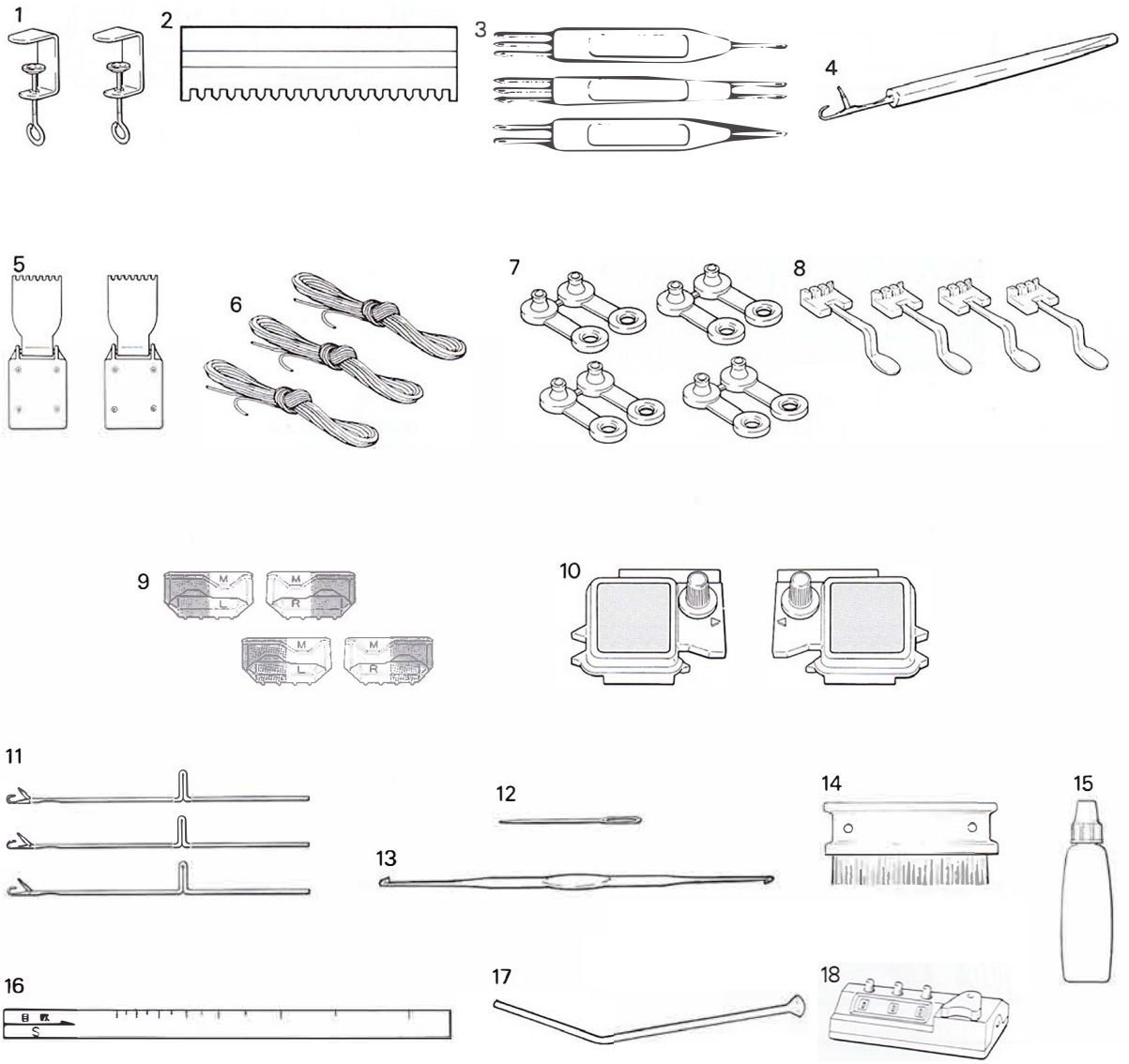
Remove the Accessory Box from the Needle Bed and open the lid.



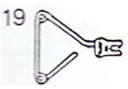
Use the lid as an accessory tray by fitting it onto the stud on the right side of the case.

Standard Accessory

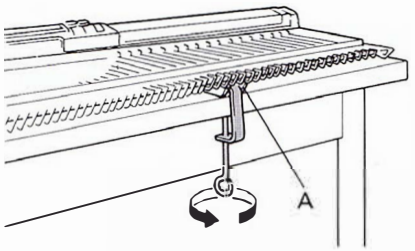
The following are packed in the Accessory Box.



1. Clamp (2)
2. Needle Pusher 0 — 1/1
3. Transfer Tool 1 — 3
   Transfer Tool 2 — 3
   Transfer Tool 1 — 2
4. Tappet Tool
5. Claw Weight (2)
6. Ravel Cord (3)
7. Card Snap (4)
8. Yarn Separator (4)
9. Point Cam M (R)/(L)
10. Magic Cam (R)/(L)
11. Latch Needle (3)
12. Tapestry Needle
13. Crochet Hook
14. Cleaning Brush
15. Oil
16. Gauge Scale
17. Card Guide
18. Row Counter
19. Tension Guide

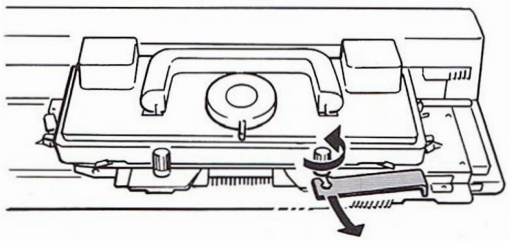


SETTING UP THE MACHINE



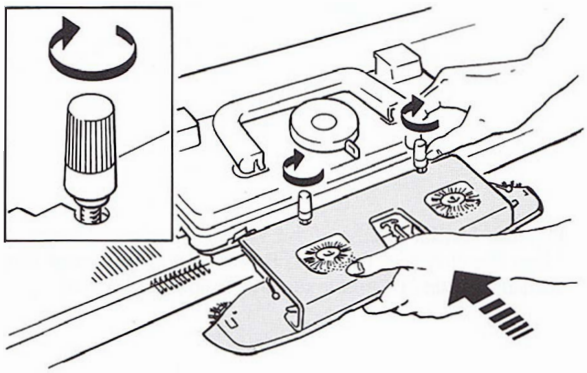
Insert the Clamps into the slots "A" at the bottom of the Needle Bed.

Fasten the Clamps by turning in the arrow direction.



Loosen both Arm Nuts by turning in the arrow direction. Remove the Carriage Fastener.

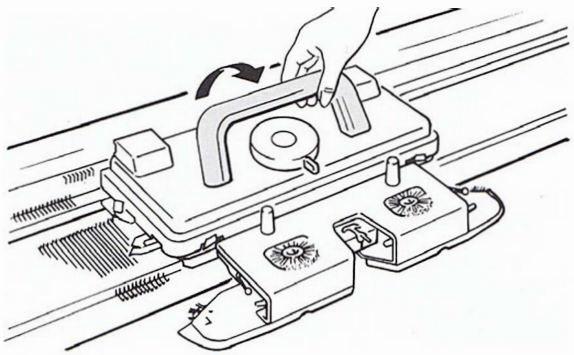
Keep the Carriage Fastener in the Accessory Box. Use it to keep the Carriage in place whilst moving the machine.



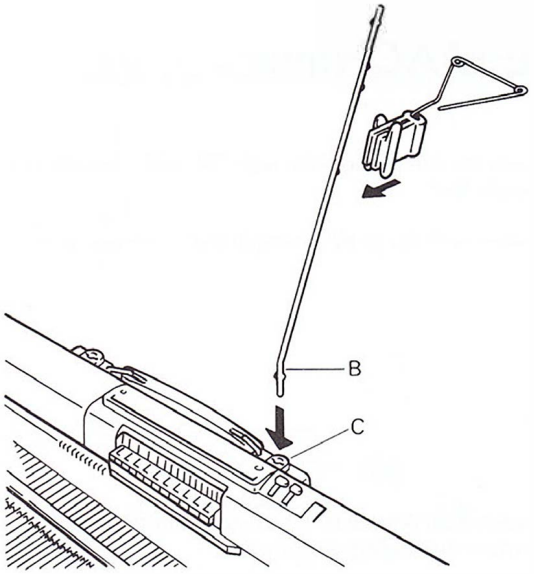
Remove the Arm from the Top Cover and position it under the two Arm Nuts.

Hold the Arm securely against the Carriage, and tighten the Arm Nuts by turning in the arrow direction.

Ensure that the Arm Nuts fit properly into the cut-out of the Arm.

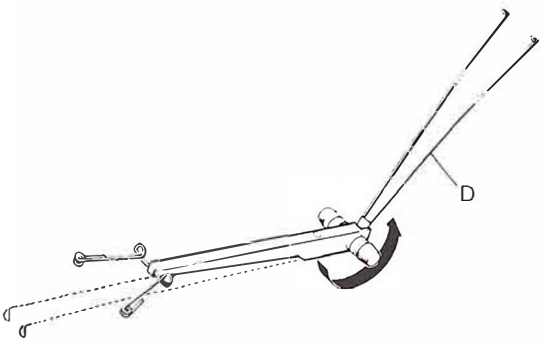


Raise the Carriage Handle until it clicks into position.

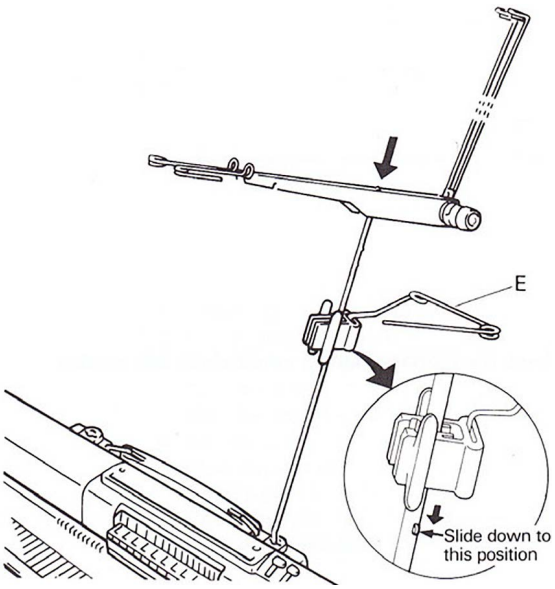


Remove the Auto Tension and Yarn Rod from the Top Cover.

Insert the short bent end of the Yarn Rod "B" into the right-hand Handle Bracket Socket "C".

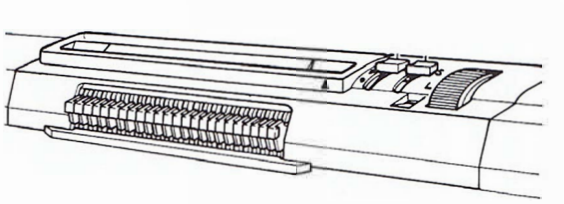


Turn the Tension Springs "D" until they click into position.



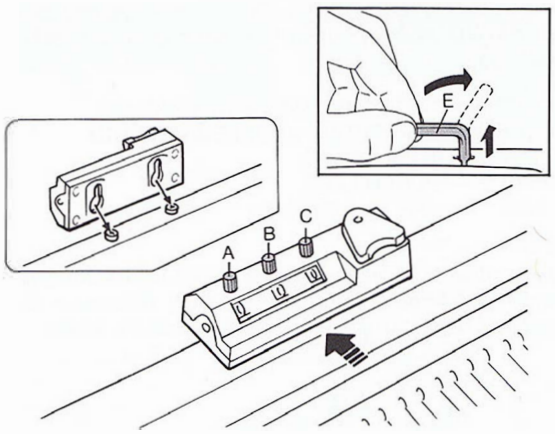
Fit Auto Tension on top of the Yarn Rod.
Align the notch of the Yarn Rod with the groove of the Tension Guide "E" and insert the Guide from above.

NAMES AND FUNCTIONS OF EACH PART



Pattern Panel

See page 18 for details.

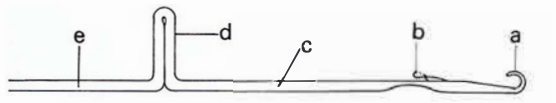


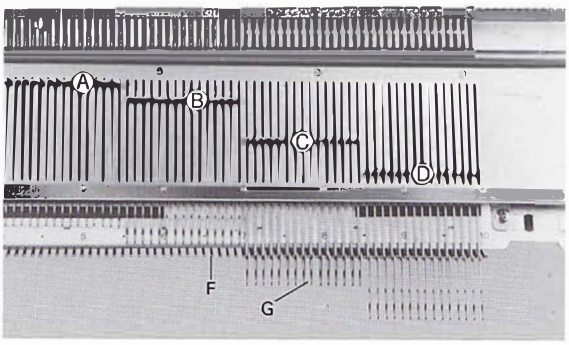
Row Counter

To reset number, turn the knurled knobs "A", "B" and "C" in either direction.

"E" — Row Counter Tripper at the right back of the Carriage operates the Row Counter.

To engage the Row Counter Tripper with the Row Counter, lift and point it towards the Row Counter. To disengage, lift and turn it to the side.





Needle Bed and Needle Positions

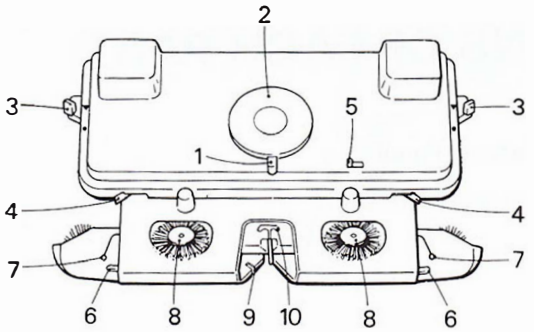
"F" — Sinker Post
"G" — Latch Needle

a — hook
b — latch
c — stem
d — butt
e — shank

On both ends of the Needle Bed are bracketed letters A, B, C and D. Align the needle butts inside the brackets.

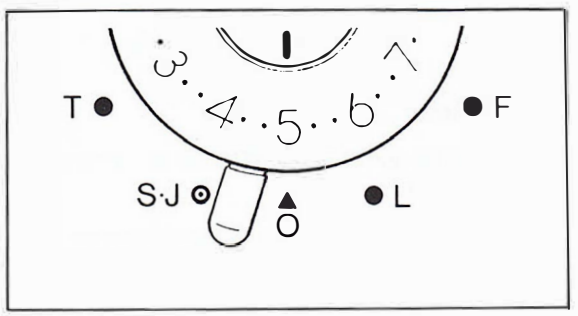
A — Needles do not knit.
B — Needles knit Stockinet and stitch patterns.
C — Needles knit Stockinet only.
D — Needles do not knit with Russel Levers at **I**. Needles are knitted back to B position with Russel Levers at **II**.

The numbers 0 — 10 on the left and right side of centre(0) indicate number of needles.



Carriage and Arm

1. Cam Lever
2. Stitch Dial
3. Side Levers
4. Russel Levers
5. Release Lever
6. Weaving Knobs
7. Weaving Yarn Holders
8. Weaving Brushes
9. Yarn Cutter
10. Yarn Feeders



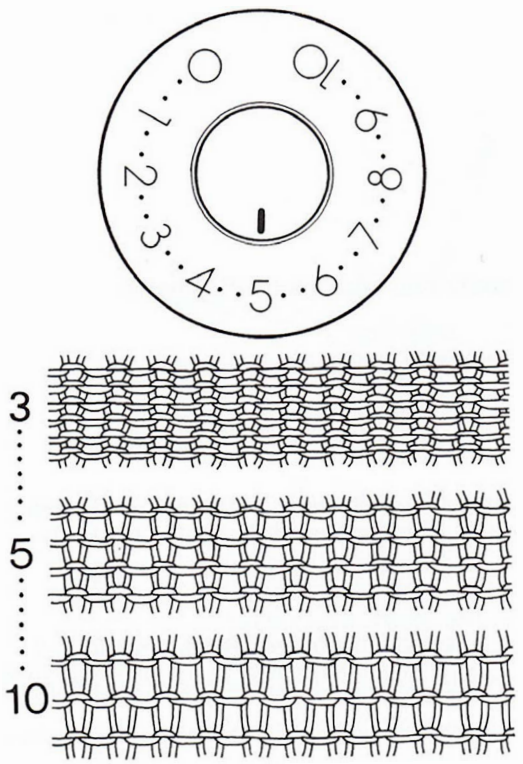
Cam Lever

Use this to select stitch type.

Five positions are marked as shown opposite, and each position is selected by setting the Cam Lever to the selected stitch type.

O (∧) — STOCKINET, WEAVING, CAST-ON
S.J (⊖) — SLIP STITCH, DOUBLE JACQUARD
T (⌒) — TUCK STITCH
L (∧) — PUNCH LACE
F (⋏) — FAIR ISLE (KNIT-IN)

Note:
The symbols in the parentheses are used in the Instruction Books for SRP50, SRP60 and SRP60N. Remenber the position of each symbol when knitting with the Ribber.



Stitch Dial

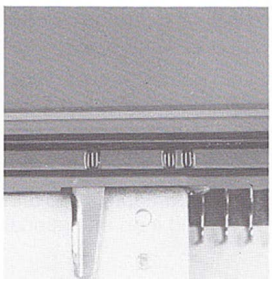
Use this to control the size of stitches.
Set the number to the I mark.

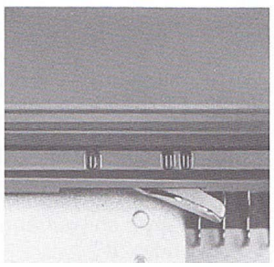
The higher the number on the Stitch Dial, the larger the stitch size (the fabric is loose). The lower the number, the smaller the stitch (the fabric is tight).

Side Levers

These control the needles in B position.

●.....Needles knit Stockinet only.
▼..... Set to this position to knit patterns using a Punch Card.

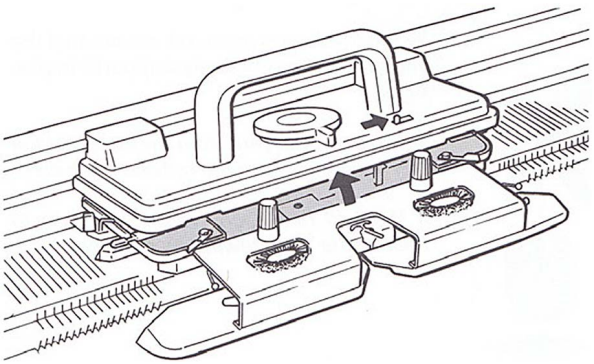




Russel Levers

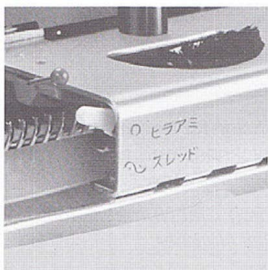
These control the needles in D position.

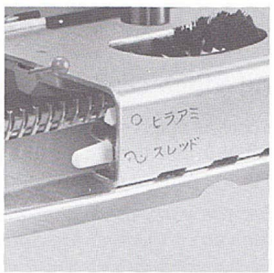
I..... Do not knit the needles in D position.
II..... Knit the needles in D position in Stockinet.



Release Lever

Using this lever, you can release the Carriage from a jam as well as move it across the Needle Bed without knitting.



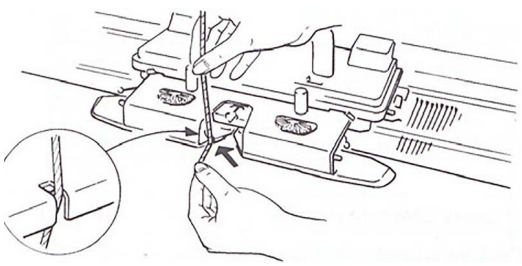


Weaving Knobs

Move this knob to position the Weaving Brush.

○..... Set to this position except for weaving.
∾..... Set to this position for cast-on and weaving.

To set the Weaving Knob to ∾, push it slightly forward; it will drop into position.

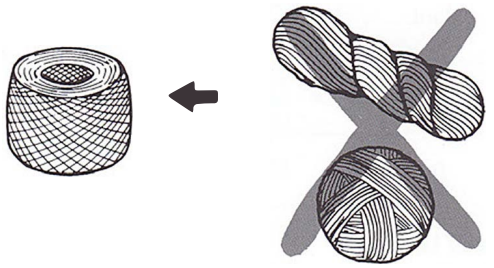


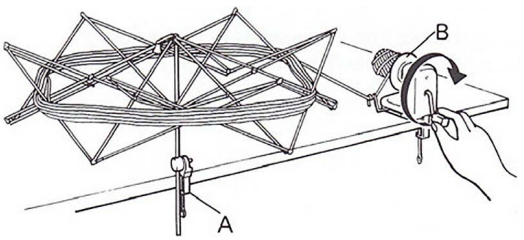
Yarn Cutter

Use this to cut the knitting yarn.

Hold the yarn with both hands and press it against the cutter.

YARN PREPARATION





Your machine is designed to knit a wide variety of yarns from cotton thread to thick yarn, but it is recommended that you should use medium 4-ply yarn for practice.

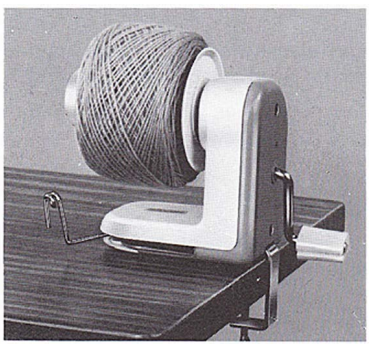
Correct preparation of yarns before you start knitting is very important. This will make knitting more enjoyable and easier. The quality of your garment will be much improved.

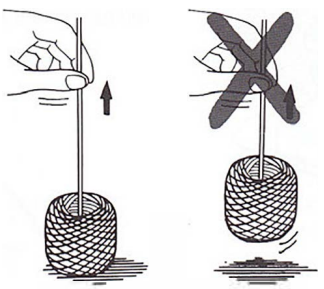
It is impossible to knit from a hank of yarn or hand wound ball.

We recommend the use of the Skein Holder* and the Wool Winder* to rewind a hank of yarn into a ball suitable for machine knitting.
* (Both are optional and available on request.)

Open the hank of yarn and place it on an optional Skein Holder "A" (or on your arms), then wind it on an optional Wool Winder "B".

For successful knitting, always use either a cone of yarn, or a ball wound using an optional Wool Winder.

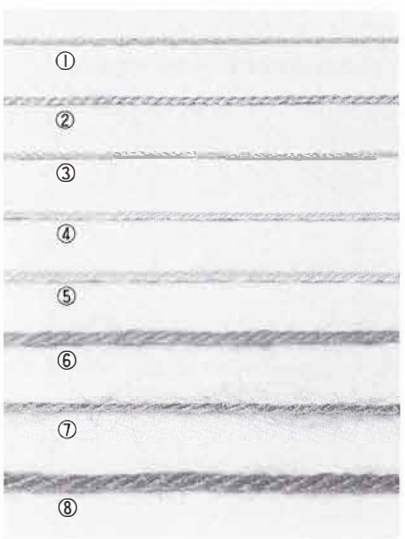




When the yarn is rewound, ensure that the yarn end comes out freely without lifting the ball.

Always use the yarn from the center of the ball and never from the outside like a corn.

If the ball has been wound too tight to release the yarn, rewind more loosely.



Yarn and Stitch Dial

To obtain correct stitch size or suitable tension for a garment, set the Stitch Dial Number according to the thickness and type of yarn, referring to the picture of yarns and the table below.

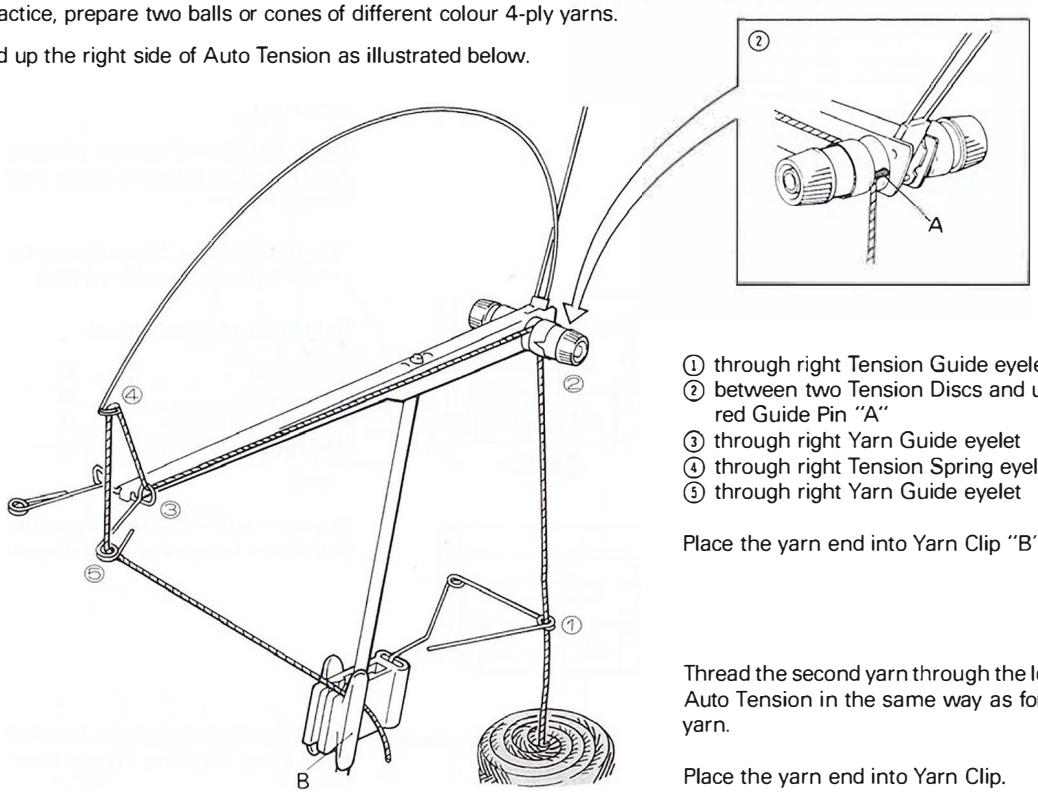
The thicker the yarn, the higher the Stitch Dial Number, and the thinner the yarn, the lower the Stitch Dial Number.

TYPE OF YARN	STITCH DIAL
① Cotton thread	2 ~ 3
② Thin yarn (2-ply)	2 ~ 3
③ Summer yarn	3 ~ 4
④ Light yarn (3-ply)	3 ~ 5
⑤ Medium yarn (4-ply)	4 ~ 6
⑥ Thick yarn	6 ~ 9
⑦ Mohair (every alternate needle)	8 ~ 10
⑧ Very thick yarn (every alternate needle)	6 ~ 9

Threading the Yarns

For practice, prepare two balls or cones of different colour 4-ply yarns.

Thread up the right side of Auto Tension as illustrated below.

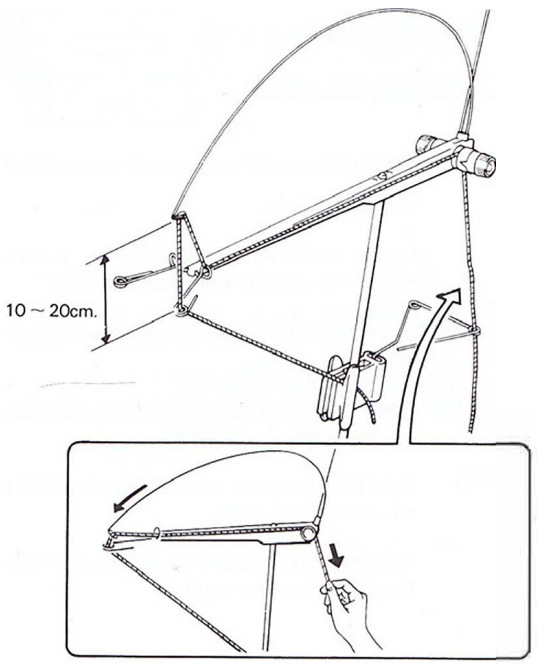


① through right Tension Guide eyelet
② between two Tension Discs and under the red Guide Pin "A"
③ through right Yarn Guide eyelet
④ through right Tension Spring eyelet
⑤ through right Yarn Guide eyelet

Place the yarn end into Yarn Clip "B".

Thread the second yarn through the left side of Auto Tension in the same way as for the first yarn.

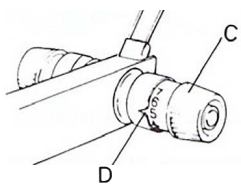
Place the yarn end into Yarn Clip.



Adjusting Tension Dial

Adjust the Tension Dial according to type of yarn by turning the Tension Dial "C" until required number corresponds to the < shape "D" using the following as a guide:

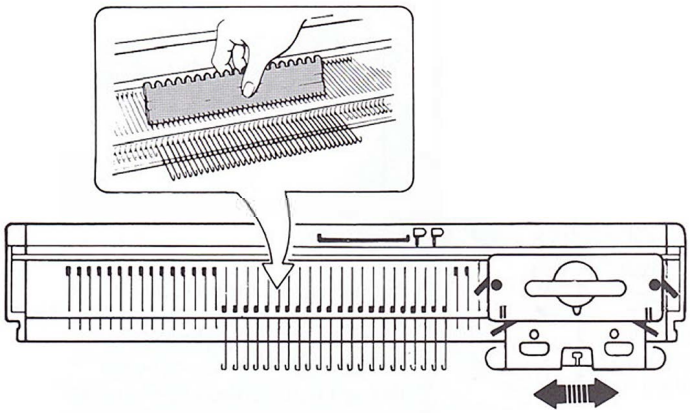
- Yarn comes out freely from the yarn ball.
- Distance between the Tension Spring and Yarn Guide..... 10 ~ 20cm. must be maintained.

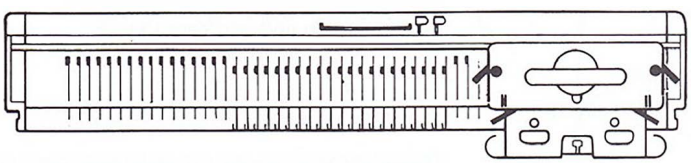


The higher the number, the tighter the tension, and the lower the number, the looser the tension.

It is advisable to free a length of the yarn from the ball before casting on.

CAST-ON AND KNITTING





Cast-on

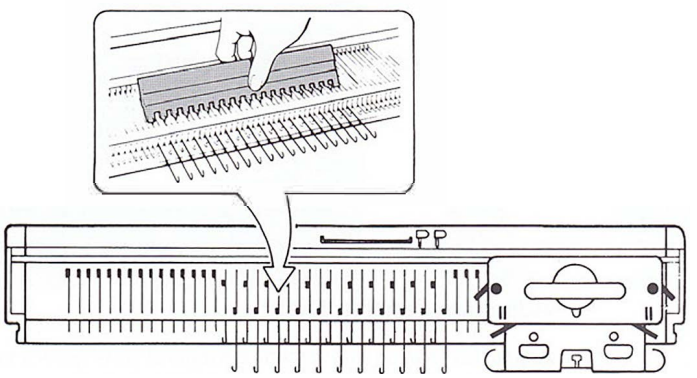
Push the required number of needles from A to D position using the straight side of the Needle Pusher.

*For practice, use 35 needles on both sides of centre(0), 70 needles in total.

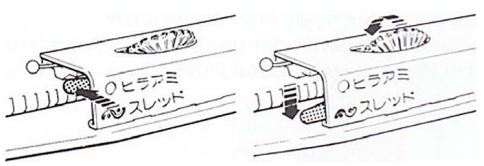
Set the Carriage as follows:

Cam Lever..... O
Side Levers..... ●
Russel Levers..... II
Weaving Knobs..... O

Slowly move the Carriage across the Needle Bed until it has passed all the needles.



Using the 1/1 side of the Needle Pusher, push every alternate needle from B to D position.

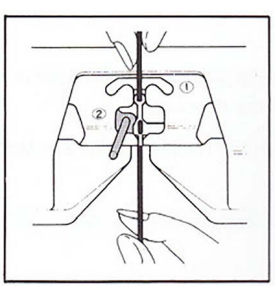


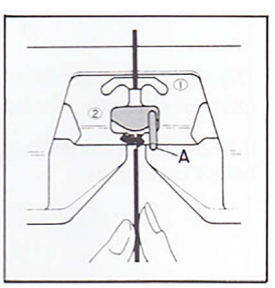
Set the Weaving Knobs into Down position.

Weaving Knobs.....∾

(To set the Weaving Knob to ∾, push it slightly forward; it drops into position.)

Set the Stitch Dial referring to the table on page 9.

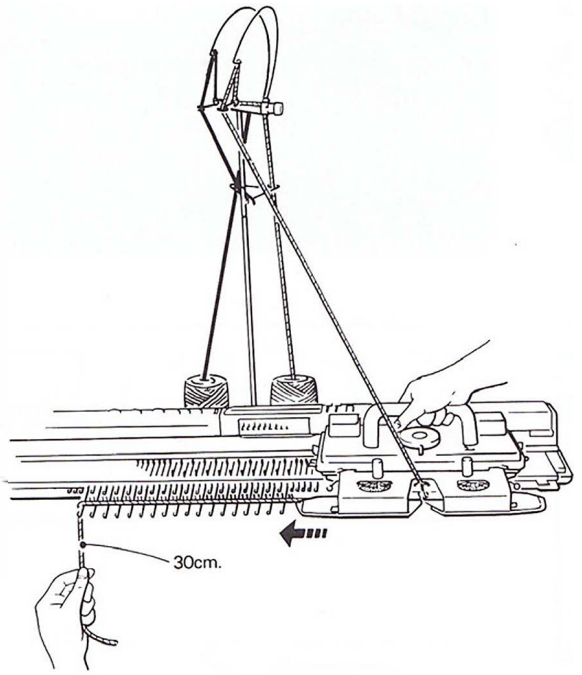




Open the Yarn Feeder by moving the Yarn Feeder Gate "A" to the left.

Hold the yarn with both hands and slide it into the Yarn Feeder.

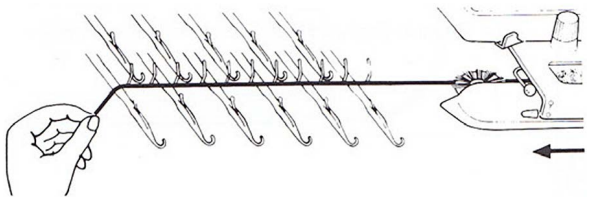
Close the Yarn Feeder by moving the Yarn Feeder Gate to the right.



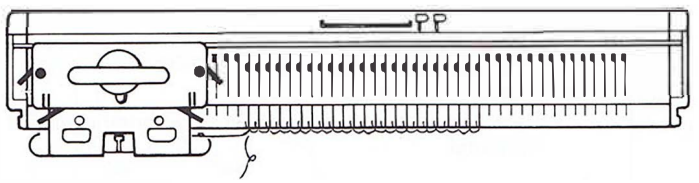
Pull the yarn end from underneath the Arm and lay it over all the needles in D position.

Hold the yarn loosely at the left about 30cm. down from the Needle Bed.

Eliminate slack yarn by pulling the yarn down at the back of the Yarn Rod until the Tension Spring is almost horizontal.

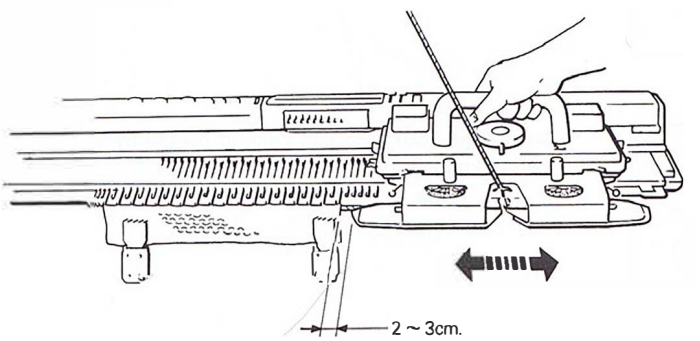


Slowly move the Carriage from right to left until it has passed all the needles to knit 1 row.



Ensure that the Arm has passed the last knitting needle by 2 ~ 3cm. before beginning the next row.

Continue to knit 2 ~ 3 rows.
Cast-on has been finished.

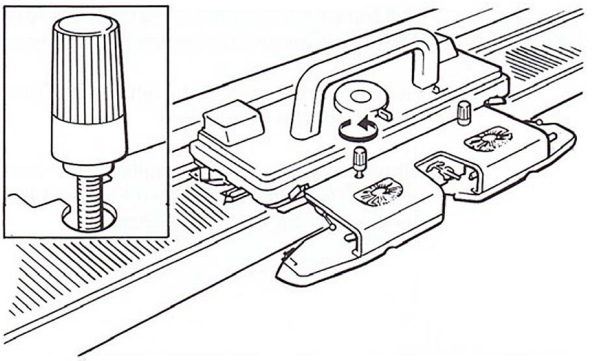


Knitting Stockinet

Set the Side Levers at ▼ and Weaving Knobs at O.

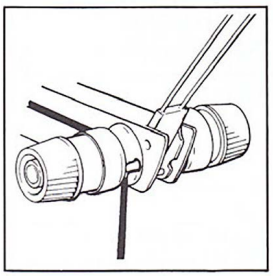
Knit 4 ~ 5 rows and hang the Claw Weights at both edges of the knitting.

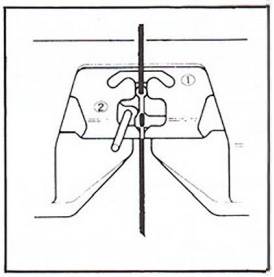
Move the Carriage from side to side to knit Stockinet.



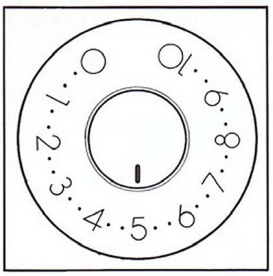
Check Points

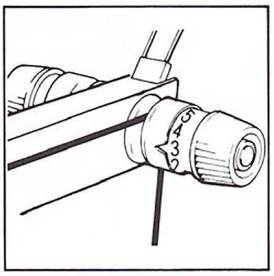
- Arm is attached to the Carriage correctly.



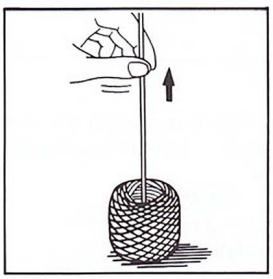


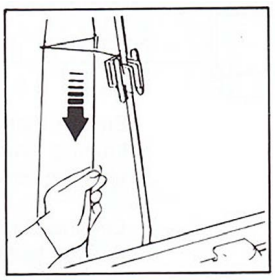
- Yarn is threaded correctly through the Auto Tension and Yarn Feeder.



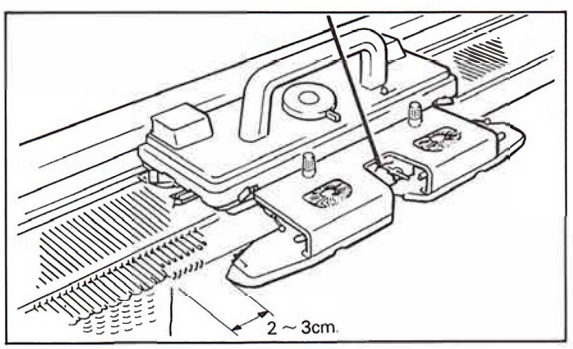


- Tension Dial and Stitch Dial are set correctly.

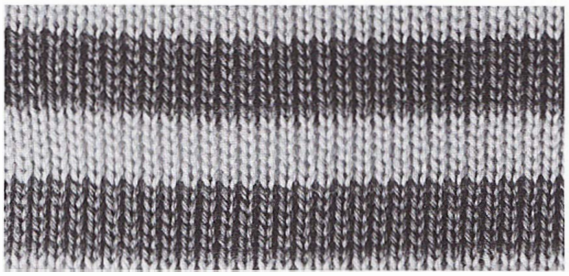




- Yarn is wound correctly.
- Slack yarn is eliminated and Tension Spring is almost horizontal.



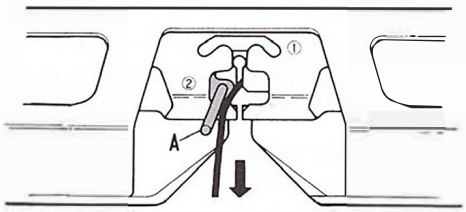
- Arm has passed the last knitting needle by 2 ~ 3cm. before knitting the next row.



Let's practice...

Knitting Stripe Pattern

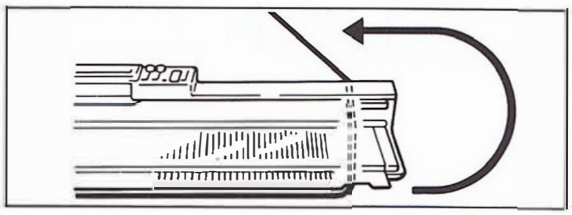
Continue to knit stripes, changing the yarn in the Feeder ① every few rows.



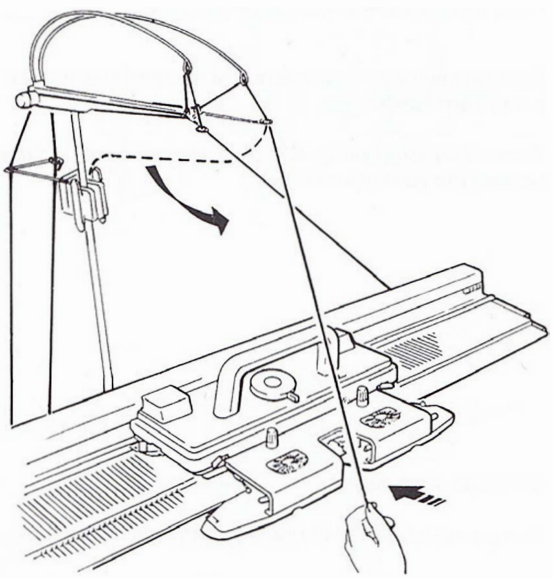
Open the Yarn Feeder by moving the Yarn Feeder Gate "A" to the left.

Remove main yarn from the Yarn Feeder.

Leave the Yarn Feeder Gate open.



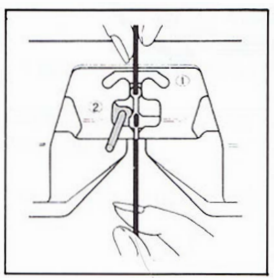
Guide the yarn under the Needle Bed from the right or left side to the rear of the machine.

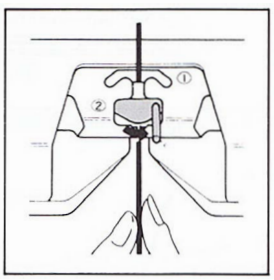


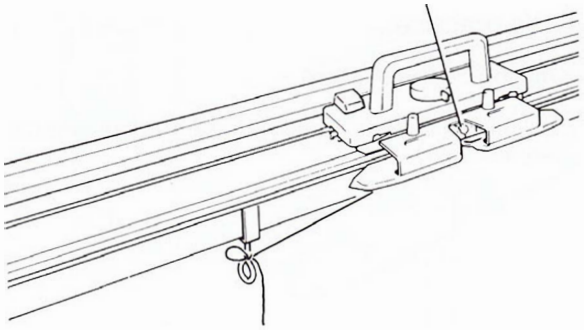
Remove the second colour yarn from the Yarn Clip and pull it down to the Yarn Feeder.

Place the yarn in the Yarn Feeder.

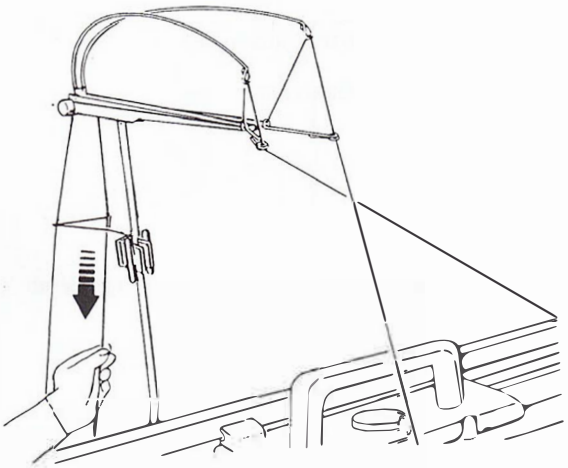
Close the Yarn Feeder by moving the Yarn Feeder Gate to the right.





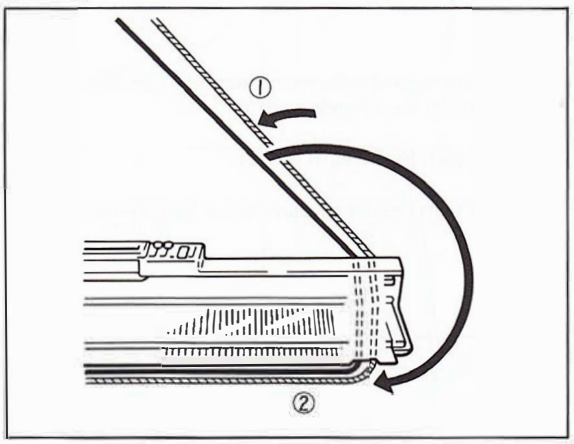


Fasten the yarn end to the Clamp nearest the Carriage.



Eliminate slack yarn by pulling the yarn down at the back of the Yarn Rod until the Tension Spring is almost horizontal.

Knit an even number of rows.

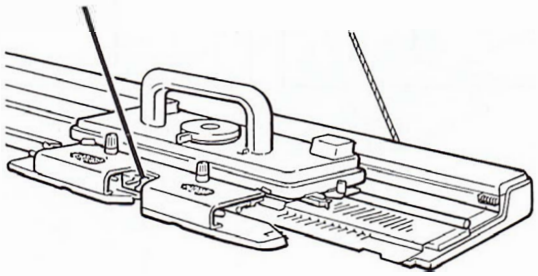


Remove the second colour yarn from Yarn Feeder ①.

Place the yarn at the rear of the machine.

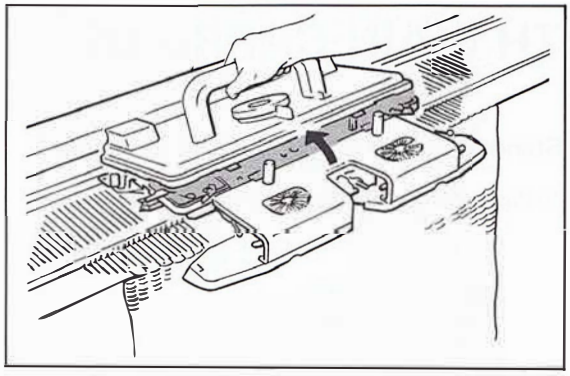
Remove main yarn from the rear of the machine and place it into Yarn Feeder ①.

To avoid crossing yarns, first place the rest yarn and then remove the yarn to be knitted.



Eliminate slack yarn.

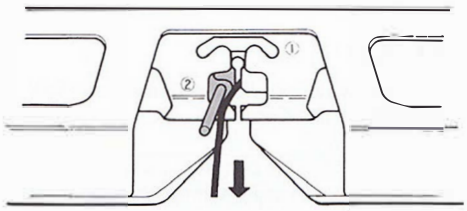
Knit an even number of rows, using yarns alternately.



Moving the Carriage Without Knitting

Stop the Row Counter and Pattern Panel if they are in use.

Push the Release Lever to raise the main part of the Carriage and move the Carriage across the fabric.

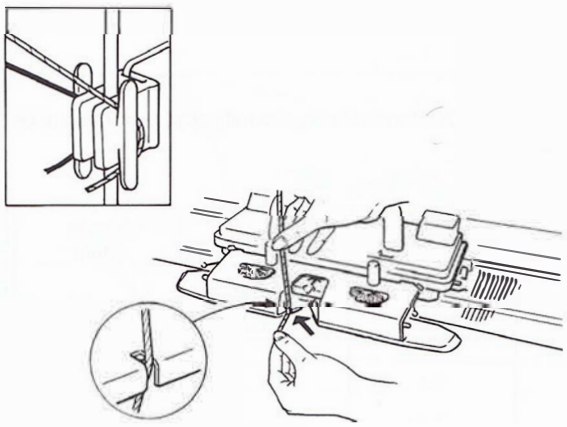


Removing the Knitting

— without casting off —

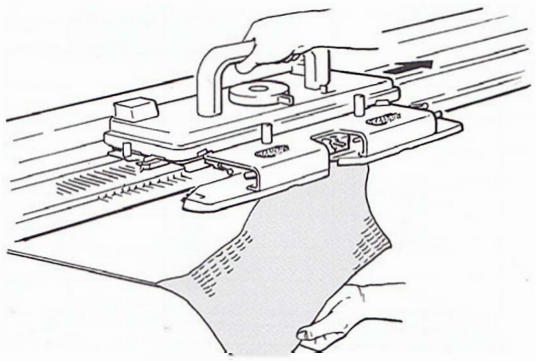
This is useful for removing tension swatches and samples quickly.

Open the Yarn Feeder and remove the yarn.



Cut main yarn using the Yarn Cutter and place its end into the Yarn Clip.

Cut the second yarn and place its end into the other Yarn Clip.

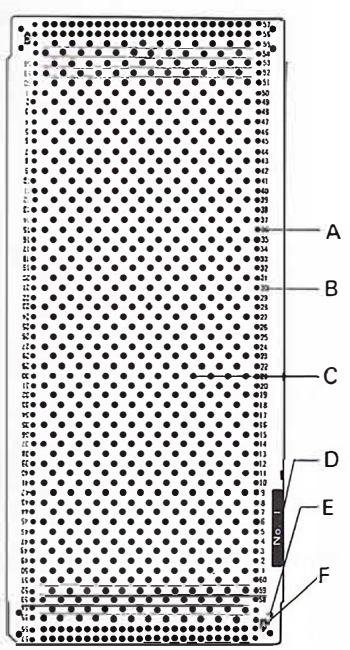


Remove weights from the knitting.

Set the Cam Lever to "O" and move the Carriage across the knitting.

The knitting comes off the needles.

PATTERN KNITTING WITH MAIN CARRIAGE



Standard Punch Cards for Main Carriage

20 Punch Cards are supplied with the machine.

Names of each part of the Card:

A — Card Feeding Hole
B — Pattern Row Number
C — Punched Pattern Holes
D — Card Number
E — Card Snap Holes
F — Card Direction Mark (See page 18)

IMPORTANT!

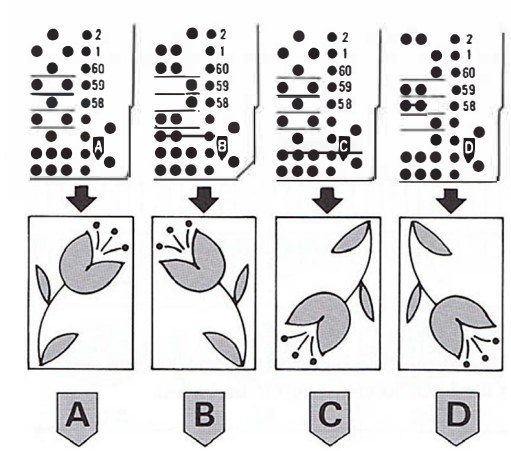
Keep the Cards away from heat and direct sunlight.
Do not fold or bend the Cards.

You can make your own patterns using optional blank cards and Handy Punch or Punching Machine.

With these 20 Punch Cards, the following patterns can be produced.

* Only for in colours

Card No.	Fair Isle (knit-in)	Tuck Stitch	Slip Stitch	Weaving	Punch Lace	Single Motif
No.1	○	○		○	○	
No.2	○		○	○	○	
No.3	○	○	○	○		
No.4	○	○	○	○		
No.5	○					○
No.6	○					○
No.7	○	○	○	○	○	
No.8	○	○	○	○		
No.9	○	○	○	○		
No.10	○	○	○			
No.11	○	○	○	○		
No.12	○	○	○			
No.13	○					
No.14	○		○	○	○	
No.15	○				○	
No.16	○				○	
No.17	○				○	
No.18	○				○	
No.19	○		*○			
No.20	○			○	○	

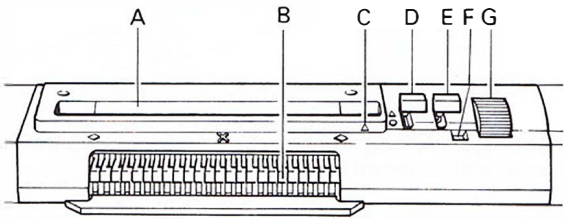


Direction of Punch Card

Each Punch Card has four different uses and is marked A, B, C and D.

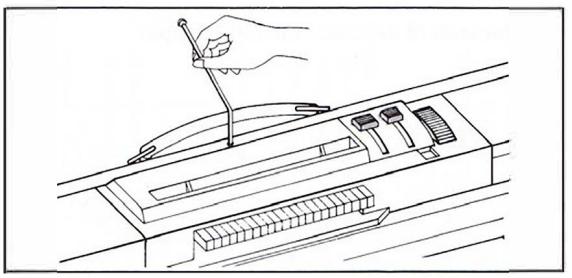
Direction "A" is basic pattern and directions B, C and D change the pattern as shown opposite.

Try to use the basic Direction "A" until you get to know the different effect well enough.



Pattern Panel

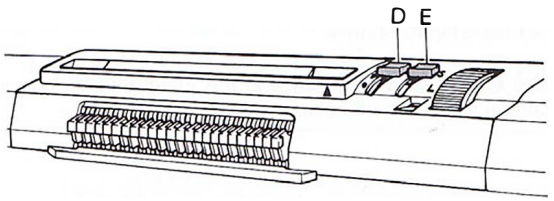
A — Card Insertion Slot
B — Touch Levers
C — Pattern Row Number Indicator
D — Stop Knob: Use this to control the card feed.
▼..... Feed Position
●..... Lock Position
E — L Knob: Use this to control the size of patterns.
S..... Standard Pattern Size
L..... Elongated Pattern Size
F — L Knob Indicator
G — Feeding Dial



Inserting Punch Card

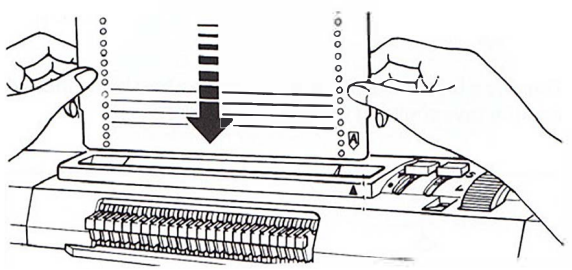
Prepare two Card Snaps and a Punch Card.

Remove the Card Guide from the Accessory Box and insert it vertically into the hole behind the Pattern Panel.

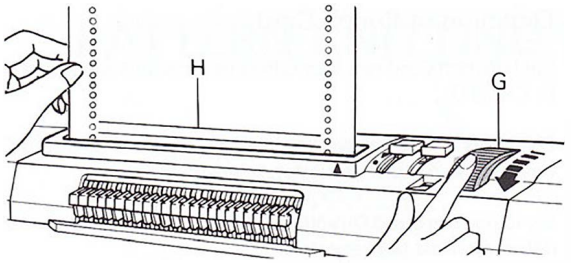


Set the Pattern Panel as follows:

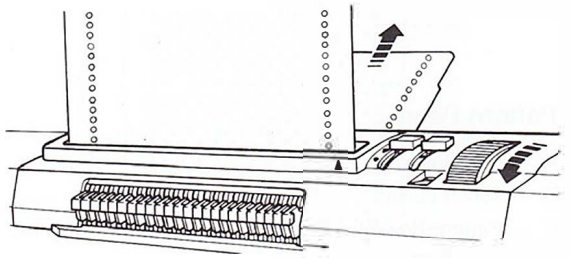
Stop Knob "D"..... ▼
L Knob "E"..... ..... S



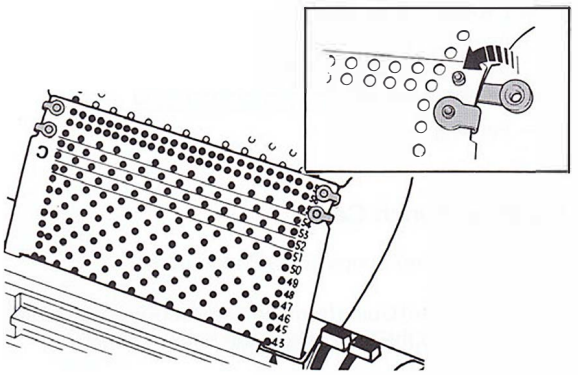
Hold the Punch Card straight with the Card Direction Mark at the right. Insert the Card into the Card Insertion Slot and push it down slightly.



Turn the Feeding Dial "G" towards you. Check that the horizontal lines "H" on the Punch Card are parallel with the Card Insertion Slot.



Continue turning the Feeding Dial until the card end comes out at the back, long enough to be folded.

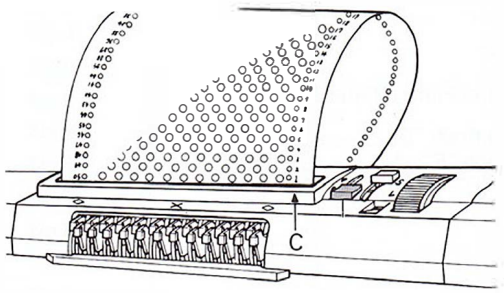


Place the back, longer end of the Card behind the front, shorter end as shown in diagram.

It is important that the Card is overlapped in this way to make the card feed smooth.

Line up the 2 holes on each side.

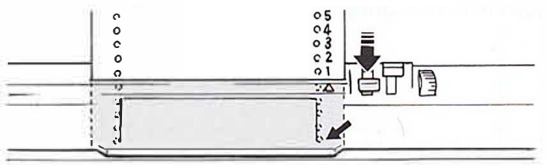
Join the ends of the Card with Card Snaps.



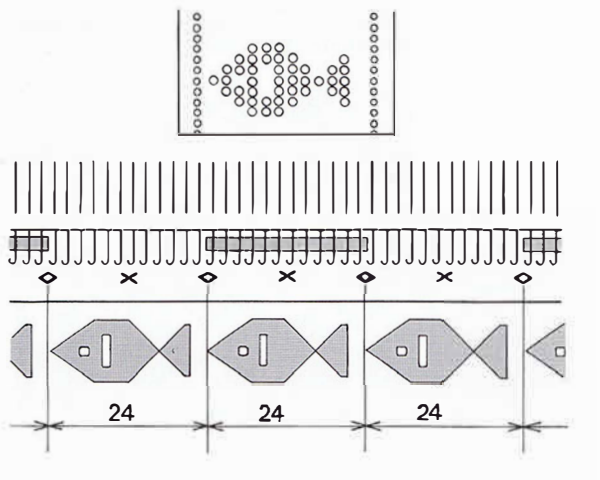
Turn the Feeding Dial until the row number "1" shows above the Pattern Row Number Indicator "C".

Set the Stop Knob to ●.

The Punch Card is locked and the initial pattern row is shown by the Touch Levers.



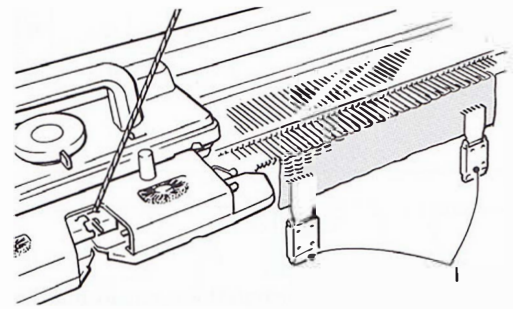
There is a 5-row difference between the row being knitted and the row showing above the indicator.



At the front of the Pattern Panel and on the front of the Needle Bed are markings ✕ and ◇.

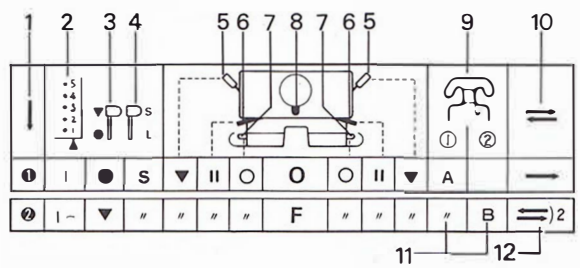
✕ — indicates the centre of a pattern.
◇ — indicates width of a pattern.

Between two ◇ markings are 24 needles.
The centre of a pattern always comes at the centre(0).



Before starting pattern knitting, knit 7～8 rows in Stockinet with main yarn or work waste knitting and leave the Carriage at the left of the Needle Bed.

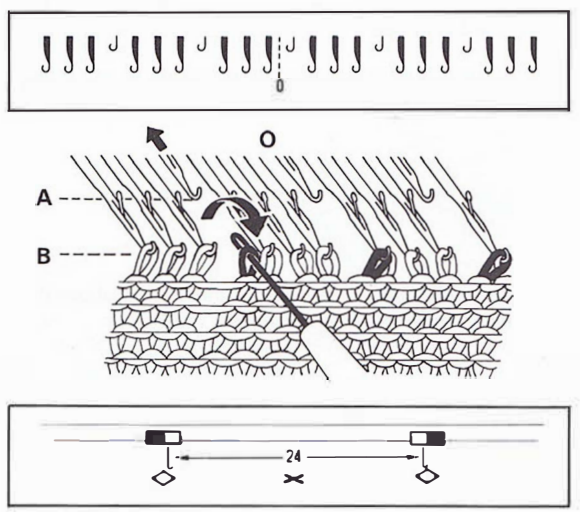
Hang the Claw Weights "1" at both edges of the knitting. (Move them up as knitting progresses.)



Reading Operation Table

1 — Order
2 — Pattern Row No.
3 — Stop Knob
4 — L Knob
5 — Side Levers
6 — Russel Levers
7 — Weaving Knobs
8 — Cam Lever
9 — Yarn Feeder ① and ②*
10 — Knitting Direction
11 — Yarn being used (A, B and C stand for different colours.)
12 — Number of rows to be knitted

* Yarn Feeder ② column also means Weaving Yarn Holder or Plating Yarn Feeder.

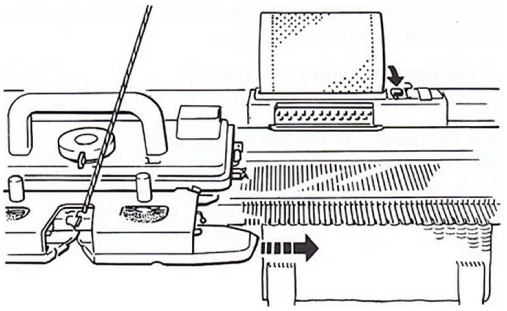


Needle arrangement

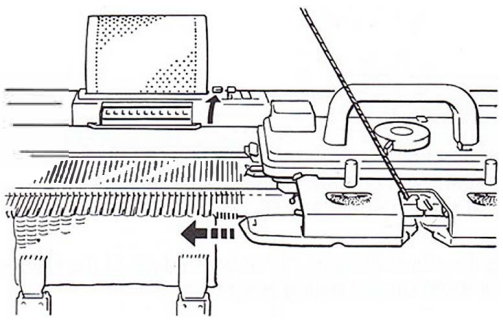
Transfer stitches on the needles to the adjacent needles and push empty needles back to A position.

Point Cam M setting

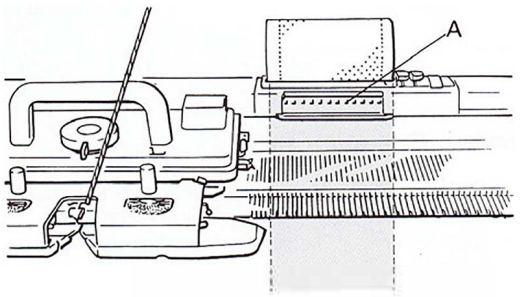
Place the Point Cams on the indicated positions of the Needle Bed.
Figure on the Operation Table shows the number of needles between Point Cams.



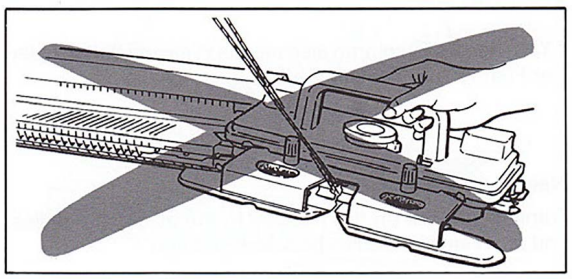
Column ❶ on the Operation Table is the row to memorize the 1st row of the pattern.



Start pattern knitting from Column ❷.



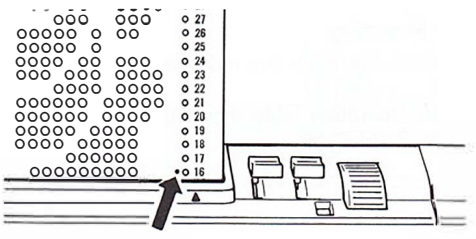
When moving the Carriage back and forth, ensure that the Carriage has completely passed all the Touch Levers "A".



Move the Carriage at an even speed.

Do not remove the Carriage from the Needle Bed when the Punch Card is in use.

If the Carriage has been removed by accident, see pages 37 ~ 38 to memorize the pattern.



If the Pattern Row Number with ● mark shows above the indicator, change the yarn to contrast yarn.

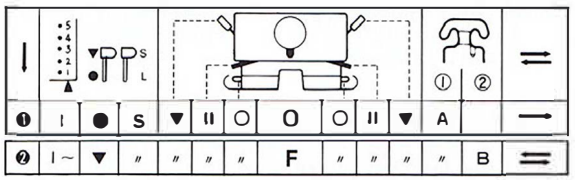
FAIR ISLE (KNIT-IN)

Two yarns of different colour are knitted simultaneously and form patterns on the fabric.

Perforated area of the Card knits the yarn in the Feeder ②, and non-perforated area knits the yarn in the Feeder ①, ground colour yarn.

The sample is knitted with Punch Card No.16-A.

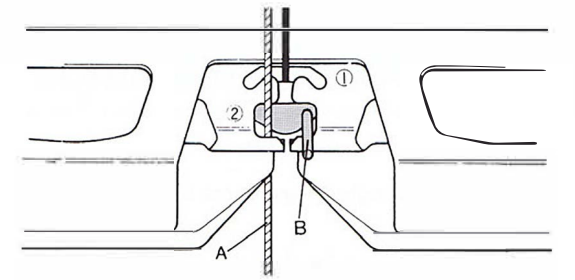
Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

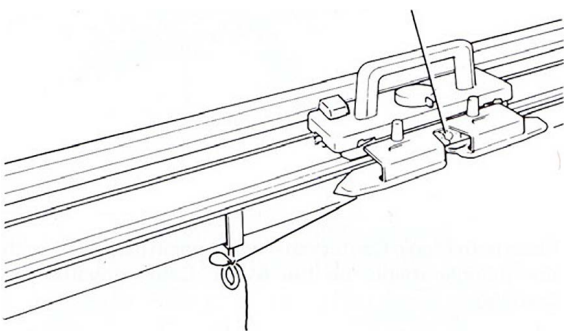
Knit 1 row from left to right.

Set the controls as required in ORDER ❷.



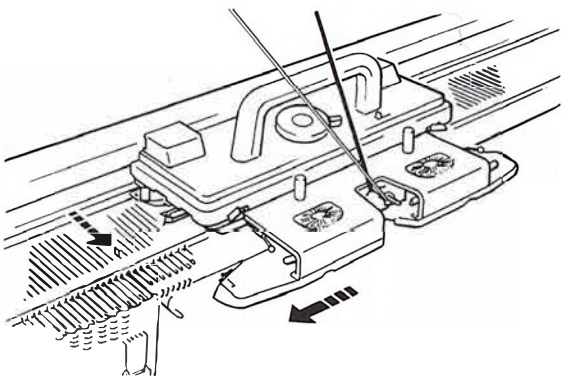
Remove the second yarn from the Yarn Clip and pull it down to the Carriage.

Insert the second yarn "A" into Yarn Feeder ②, left side of the Guide Pin "B".



Fasten the yarn end to the Clamp.

Eliminate slack yarn by pulling the yarn down at the back of the Yarn Rod.



If the end stitches do not knit properly, push end needle on the Carriage side to D (or C in partial knitting) position before knitting the next row.

Knit the required number of rows as above.

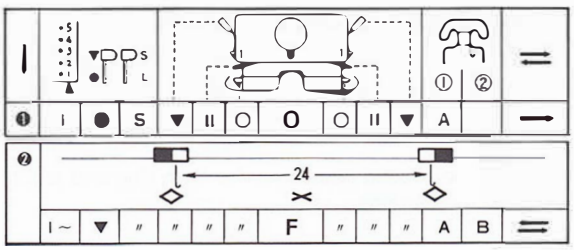
SINGLE MOTIF

Make a pattern (usually in Fair Isle) wherever you like on the knitting.

This sample is knitted with Punch Card No.5-A.

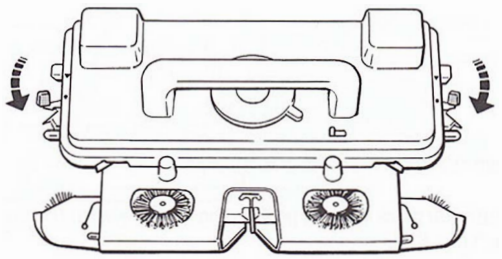
Hang the Claw Weights at both edges of the knitting.

Sometimes the tension becomes tight when the pattern is away from the centre or if the knitting is wide. Knit the Single Motif within the centre 150 needles.



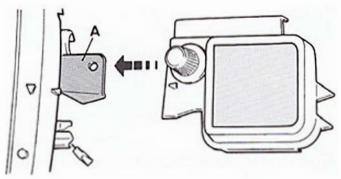
Set the controls as required in ORDER ❶.

Knit 1 row from left to right.

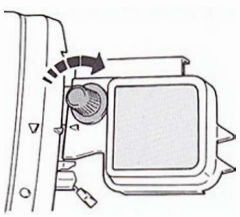


Take the left and right Magic Cams from the Accessory Box.

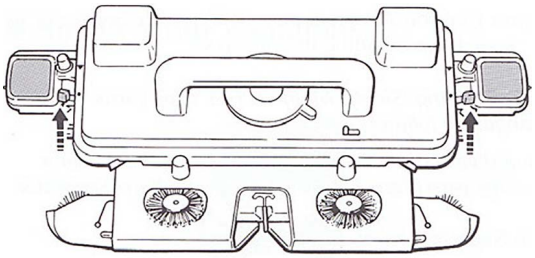
Set both Side Levers to ●.



Place both Magic Cams onto the extension plates "A" with the triangle marks on the Magic Cams towards the Carriage.

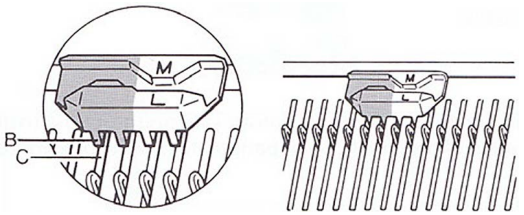


Fasten the Magic Cams to the extension plates by turning the knurled knobs clockwise.



Reset both Side Levers to ▼.

If you make a mistake while knitting and move the Carriage using the Release Lever, remove the Magic Cams from both sides of the Carriage.

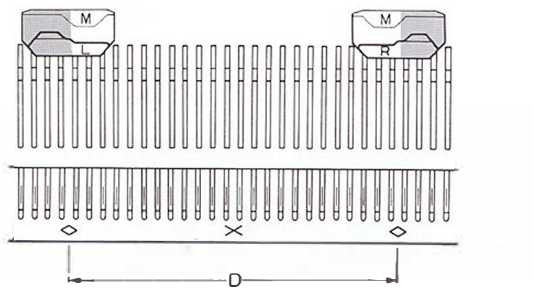


Remove the left and right Point Cams from the Accessory Box.

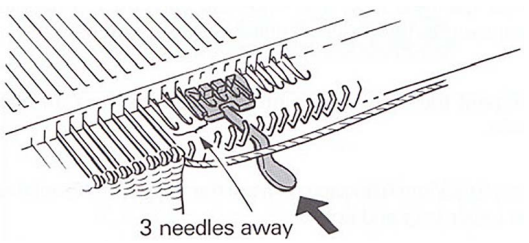
Point Cam M (Left) — marked M, L
Point Cam M (Right) — marked M, R

Set both Point Cams so that their divisions (orange and white) are between the 12th and 13th needles on both sides of centre(O) of the Needle Bed.

Ensure that the four studs "B" of the Point Cam fit correctly into the needle slots "C", at the back of the Needle Bed.



"D" — Single Motif Section

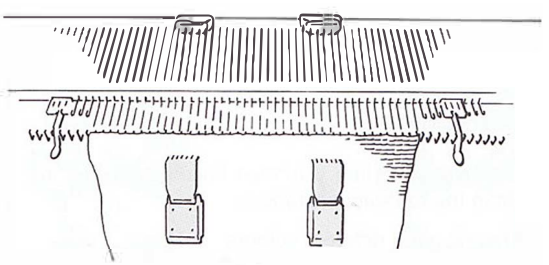


Take two Yarn Separators from the Accessory Box.

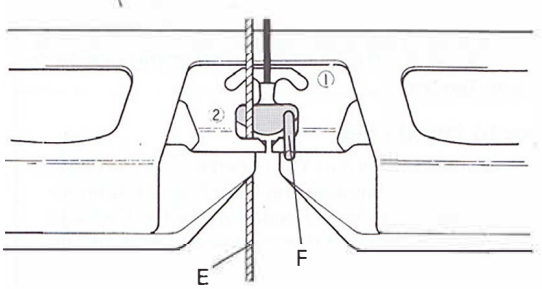
Open latches of the 4th, 5th and 6th non-working needles at the left and right of the working needles.

Insert the Yarn Separators under these three needles, and push them back as far as they go.

The yarn must pass over the Yarn Separator.



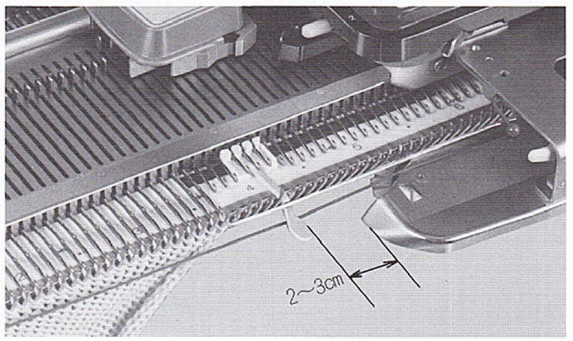
Hang the Claw Weights on the knitting, below the left and right Point Cams.



Set the controls as required in ORDER ❷.

Insert the second yarn "E" into Yarn Feeder ②, at the left side of the Guide Pin "F".

Knit 1 row from right to left.



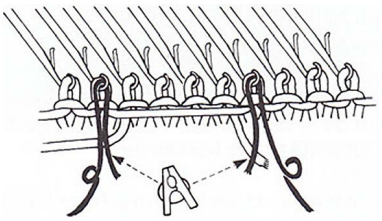
Ensure that the Arm has passed the Yarn Separator by 2 ~ 3cm. before knitting the next row.

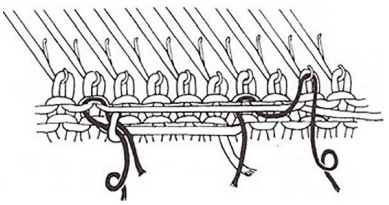
When knitting Single Motif in Fair Isle, yarns must be arranged as follows:

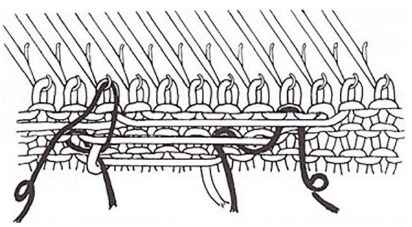
Ground yarn (Yarn Feeder ①) — over Yarn Separator
Contrast yarn (Yarn Feeder ②) — under Yarn Separator

Yarn Separator must part two yarns.

If they are both at the same side of the separator, part them manually.







To eliminate separation of contrast yarn and ground yarn at the edge of the Single Motif pattern, follow the procedure below.

1. Prepare two pieces of yarn, 50 ~ 60cm. long, cut from the ground yarn.

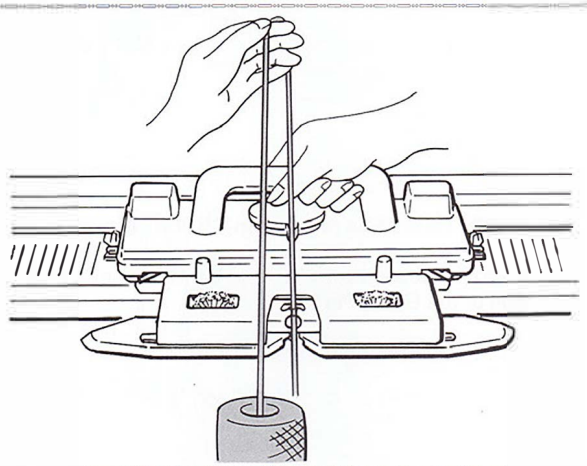
2. Place the yarns in the hook of the needle immediately adjacent to the last needle knitted in contrast yarn at both edges of the Single Motif.
   It is advisable to hook a clip to the short end of the yarn.

3. Knit the next row, and place the yarn in the hook of the needle immediately adjacent to the Single Motif at Carriage side.

4. Knit the next row, and hook the yarn on the needle adjacent to the Single Motif at Carriage side.

5. Repeat the above steps on each row at the Carriage side.

To knit Stockinet following on from the Single Motif, set the Cam Lever to **O** and knit.



Hand Feeding

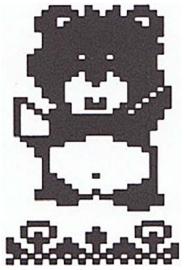
Feeding the yarn into the Yarn Feeder by hand is useful in the following instances.

- Knitting three different colours.
- Knitting Ravel Cord to separate the main knitting from waste knitting to make a hem.
- The yarn end being too short to thread through the Auto Tension.

How to Hand Feed

— Place the third yarn in Yarn Feeder ①.
— Hold the yarn between the thumb and forefinger lightly above the Yarn Feeder, move the Carriage slowly to knit the first row, and repeat throughout.

● Single Motif Variations

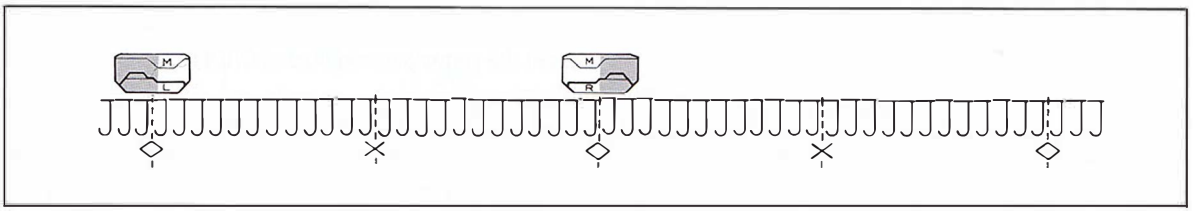


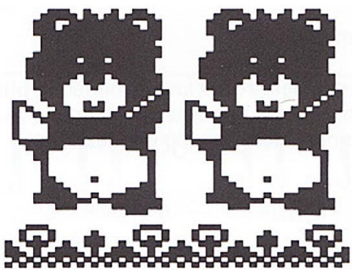
Two sets of the left and right Point Cams are included in accessories.

You can make a wide variety of Single Motif designs by use of these Point Cams as shown below.

Knitting 1 Bear

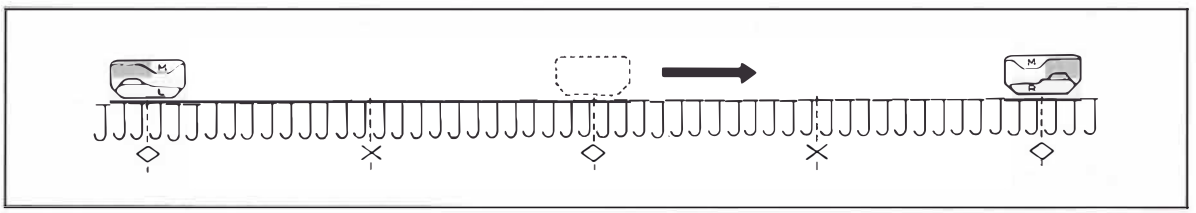
To knit 1 bear, place the left and right Point Cams at two adjacent ◇ marks. (See page 24)

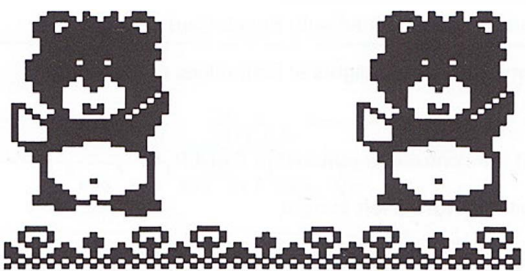




Knitting 2 Bears

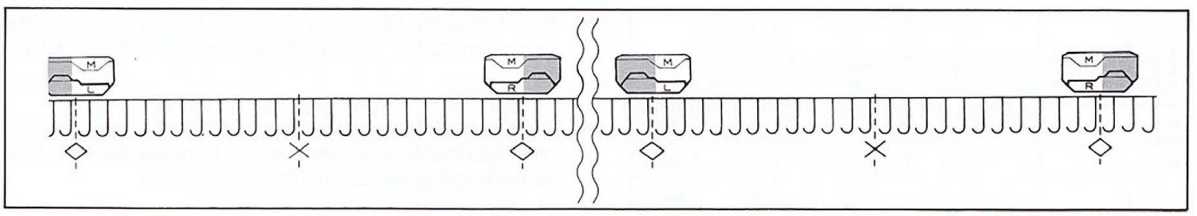
To knit 2 bears, move the left or right Point Cam to the next adjacent ◇ mark.



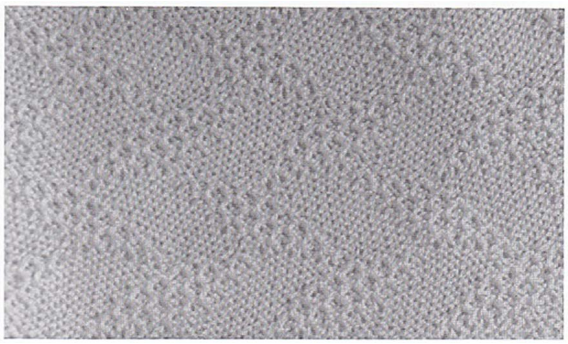


Knitting 2 Bears With a Gap Between

To leave a space between two bears, place another set of the Point Cams at two ◇ marks, away from the first set.



TUCK STITCH

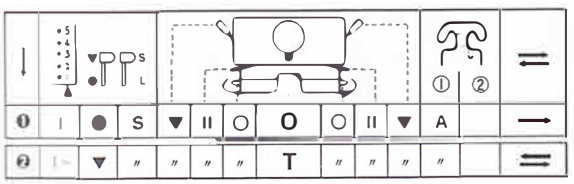


Perforated area of the Card knits Stockinet and non-perforated area leaves a loop of yarn in needle hooks.

You can tuck up to 4 rows using medium type smooth yarn.

The sample is knitted with Punch Card No.12-A.

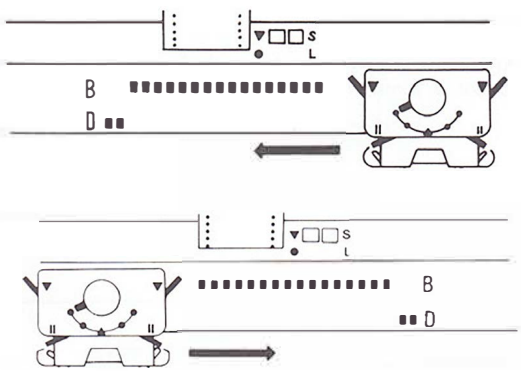
Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

Knit 1 row from left to right.

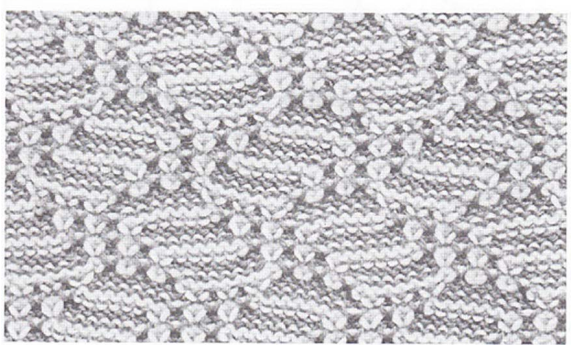
Set the controls as required in ORDER ❷.



Continue knitting.

If the edge stitches are not knitted perfectly, push two end needles on the side opposite the Carriage to D (or C in partial knitting) before knitting the next row.

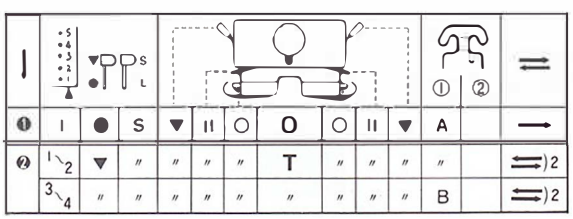
● Tuck Stitch in Colours



Knit two or more different colour yarns alternately in tuck stitch pattern.

The sample is knitted with Punch Card No.12-A.

Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

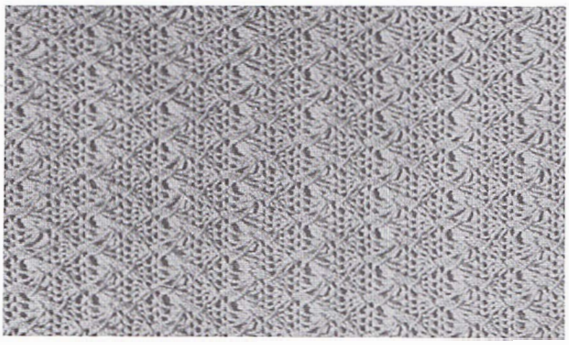
Knit 1 row from left to right.

Set the controls as required in ORDER ❷.

Knit following Operation Table, changing yarns in the same way as for "Knitting Stripe Pattern" on pages 14 ~ 15.

If the edge stitches are not knitted perfectly, push two end needles on the side opposite the Carriage to D (or C in partial knitting) before knitting the next row.

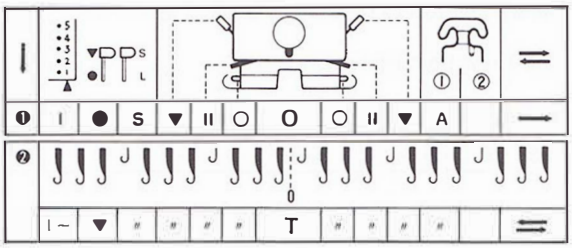
● Tuck Lace



Arrange the needles by transferring stitches.

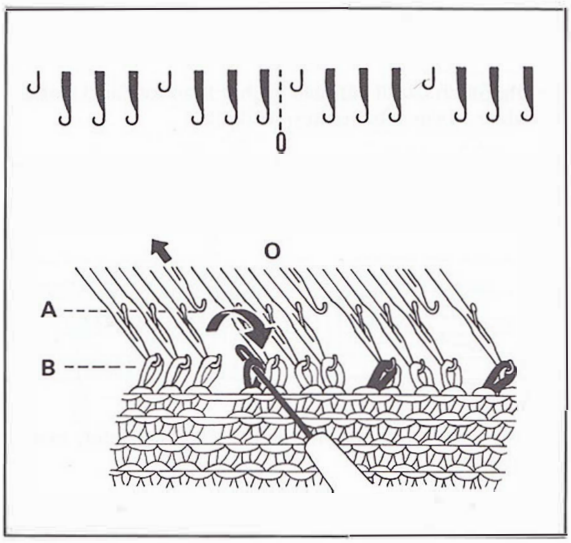
The sample is knitted with Punch Card No.3-A.

Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

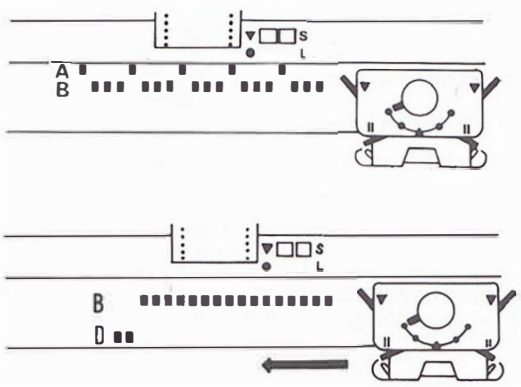
Knit 1 row from left to right.



Transfer every fourth stitch to its adjacent needle starting at the centre(0) on the Needle Bed as shown opposite.

Push the empty needles back to A position.

Set the controls as required in ORDER ❷.



Continue knitting.

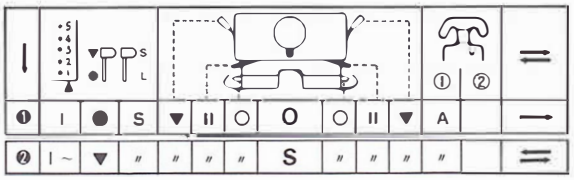
If the edge stitches are not knitted perfectly, push two end needles on the side opposite the Carriage to D (or C in partial knitting) before knitting the next row.

SLIP STITCH

Perforated area of the Card knits Stockinet and non-perforated area leaves a float of yarn on the purl side of the fabric.

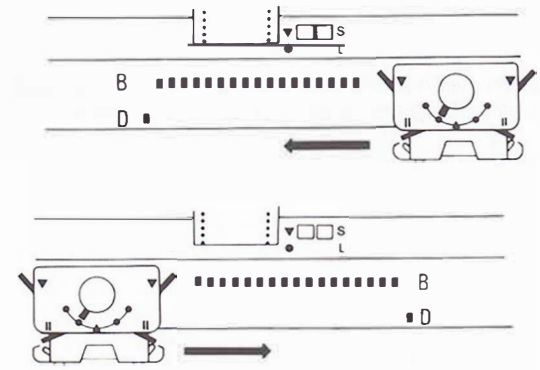
The sample is knitted with Punch Card No.14-A.

Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

Knit 1 row from left to right.



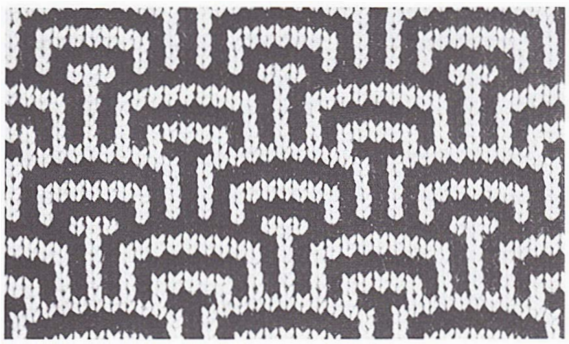
Set the controls as required in ORDER ❷.

Continue knitting.

Set the Stitch Dial 1 number higher than for Stockinet as the fabric of slip stitch pattern is tighter.

Push one end needle on the side opposite the Carriage to D (or C in partial knitting) position before knitting the next row.

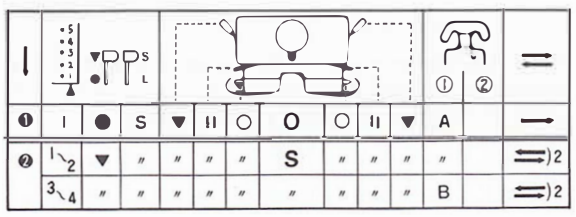
● Slip Stitch in Colours



Knit two or more different colour yarns alternately in slip stitch pattern.

The sample is knitted with Punch Card No.10-A.

Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

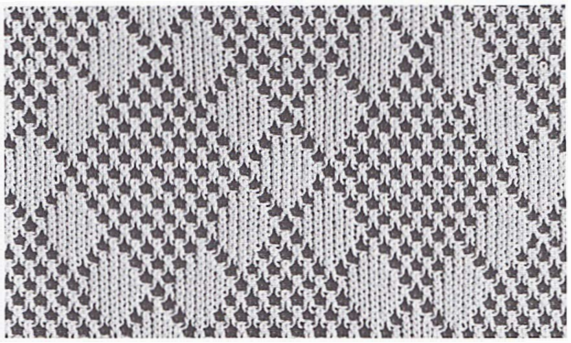
Knit 1 row from left to right.

Set the controls as required in ORDER ❷.

Knit following the Operation Table, changing yarns in the same way as for "Knitting Stripe Pattern" on pages 14 ~ 15.

Push one end needle on the side opposite the Carriage to D (or C in partial knitting) position before knitting the next row.

PUNCH LACE

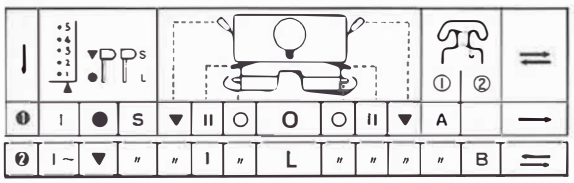


Combinations of thick yarn and self-coloured very fine yarn produce a lace effect pattern.

Perforated area of the Card knits the yarn in the Feeder ② (thinner yarn) and non-perforated area knits both yarns together.

The sample is knitted with Punch Card No.18-A.

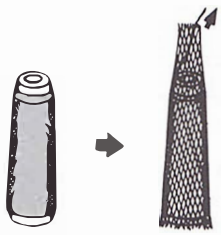
Hang the Claw Weights at both edges of the knitting.



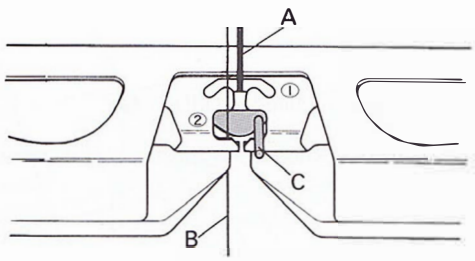
Set the controls as required in ORDER ❶.

Knit 1 row from left to right.

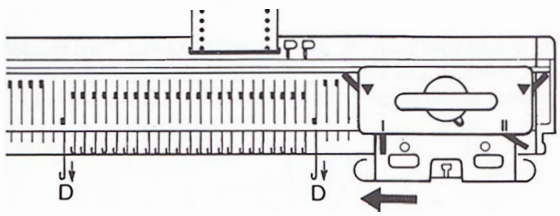
Cover spool of nylon thread with Stop Net (option) or with a cut-piece of stocking.
Thread thinner yarn through the Auto Tension.



Set the controls as required in ORDER ❷.



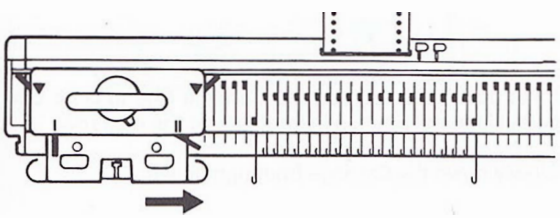
Put thicker yarn "A" into Yarn Feeder ① and thinner yarn "B" into Yarn Feeder ② at the left side of Guide Pin "C".



Bring the 1st and last needles to D position.

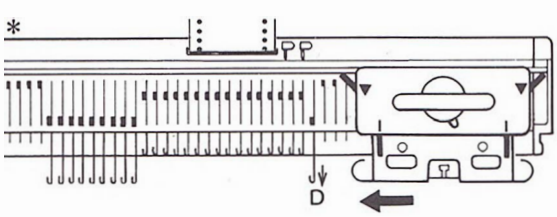
Knit from right to left.
The end needles will not knit.

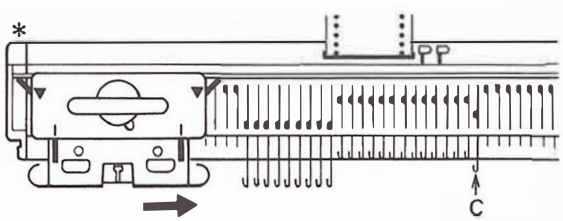
Knit from left to right.
The end needles will be knitted back to B position.



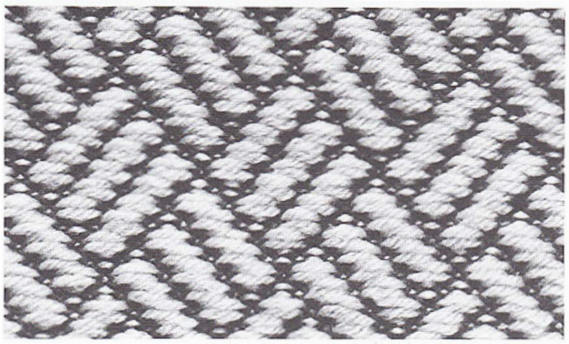
Knit the required number of rows, pushing the 1st and last needles to D position when the Carriage is at the right.

*(When partial knitting, set both Russel Levers to I, push one needle at opposite side of resting needles to D position to knit from right to left and push back the needle to C position to knit from left to right.)





WEAVING

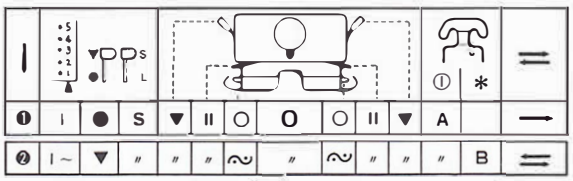


By passing fancy yarn or different materials (hereafter called weaving yarn) between the Stockinet stitches on purl side, a pattern is made on the surface of the fabric.

Perforated area of the Card passes the weaving yarn over the needles, and non-perforated area passes the weaving yarn under the needles.

The sample is knitted with Punch Card No.9-A.

Hang the Claw Weights at both edges of the knitting.

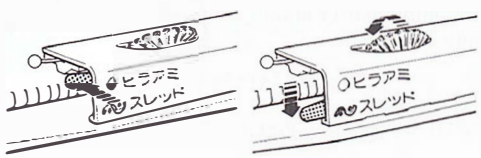


Set the controls as required in ORDER ❶.

Knit 1 row from left to right.

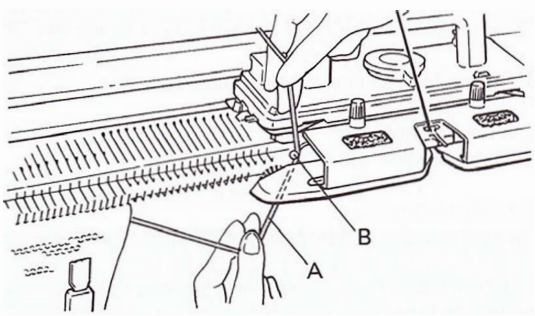
Thread the weaving yarn through the Auto Tension and pull it down to the Needle Bed.

Fasten the yarn end to the Clamp nearest the Carriage. Adjust the Stitch Dial. (1 number higher than for Stockinet)



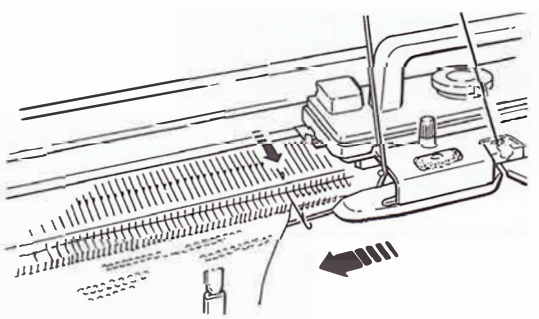
Set the controls as required in ORDER ❷.

To set the Weaving Knob to ∾, push it slightly forward; it drops into position.



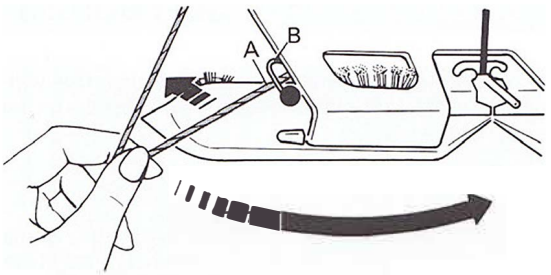
"＊" mark in the Yarn Feeder column means Weaving Yarn Holder.

Hook weaving yarn "A" into the left Weaving Yarn Holder "B". (Always put weaving yarn in Weaving Yarn Holder nearest to the knitting, as shown in the illustration left.)



Push one end needle on the Carriage side to D (or C in partial knitting) position before knitting the next row.

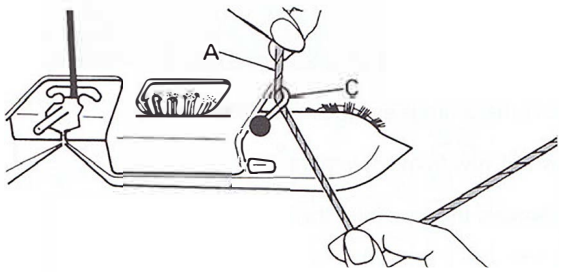
Slowly move the Carriage from right to left.



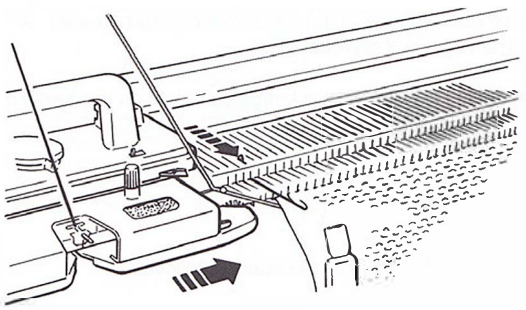
Remove weaving yarn "A" from the left Weaving Yarn Holder "B".

Bring the weaving yarn underneath the Arm and move it to the right side of the Carriage.

At this step, it may be necessary to push the Carriage slightly back in the original direction to free the weaving yarn from the brushes under the Arm.

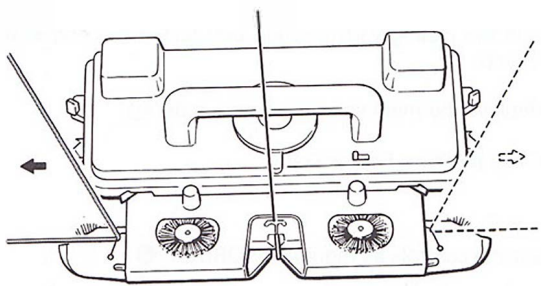


Hook the weaving yarn into the right Weaving Yarn Holder "C".



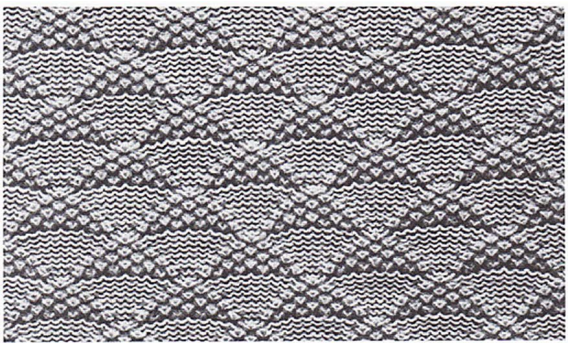
Push one end needle on the Carriage side to D (or C in partial knitting) position before knitting the next row.

Knit from left to right.



Knit the required number of rows always placing weaving yarn in the leading side of the Carriage.

PLATING

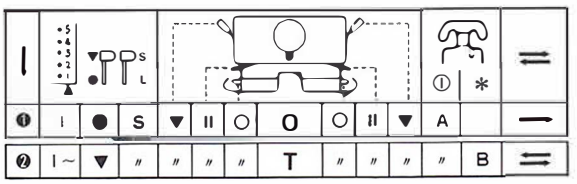


Two different colour yarns are knitted together. One yarn appears on one side while the second yarn appears on the reverse of the fabric.

The sample is knitted with Punch Card No.10-A.

Since two yarns are knitted together, use thinner yarns than for other patterns, and Stitch Dial must be set at the number which totals the Stitch Dial number for each type of yarn used. (e.g. If two tension 3 type yarns are used, knit at Stitch Dial 6)

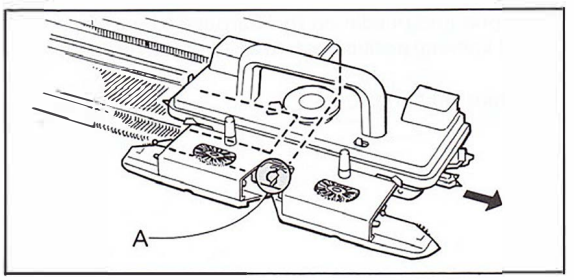
Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

Knit 1 row from left to right.

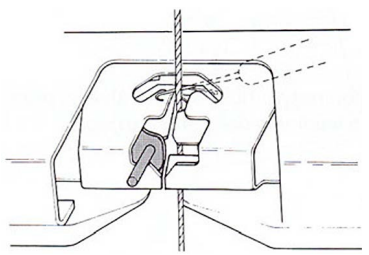
Remove the yarn from the Yarn Feeder.



Move the Carriage to the right until the Yarn Feeder "A" is off the edge of the Needle Bed.

Remove the second yarn (plating yarn) from the Yarn Clip and pull it down to the Carriage.

Place the plating yarn into Yarn Feeder ①.



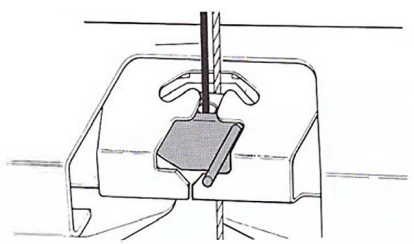
Thread the Plating Yarn Feeder as follows:

Insert the Tappet Tool into the Plating Yarn Feeder from behind and catch the plating yarn in the hook.

Pull the plating yarn through and fasten the end to the Clamp.

Replace the main yarn into Yarn Feeder ①.

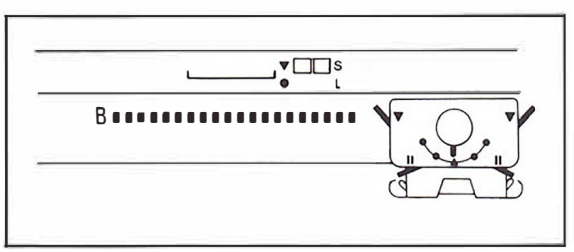
Close the Yarn Feeder Gate.



Set the controls as required in ORDER ❷.

"＊" mark in the Yarn Feeder column means Plating Yarn Feeder.

Knit the required number of rows.

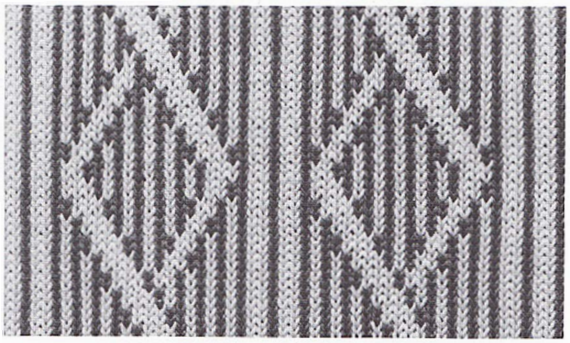


Each yarn appears on the fabric as follows:

Plating yarn.. .....on purl side
Main yarn .....on plain side

To knit plating in Stockinet, set the controls as required in Stockinet knitting.

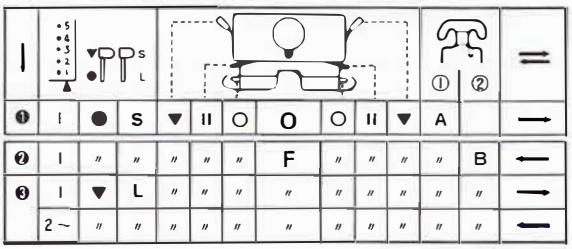
L KNOB FUNCTION



When the L Knob is set to L, the Punch Card moves only on every alternate row, thus producing an elongated pattern. To get correct pattern using L Knob, set the Stop Knob and L Knob as follows:

The sample is knitted with Punch Card No.20-A.

Hang the Claw Weights at both edges of the knitting.



Set the controls as required in ORDER ❶.

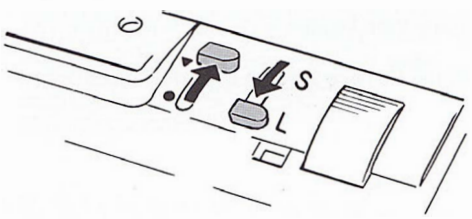
Knit 1 row from left to right.

The 1st Pattern Row (ORDER ❷)

Stop Knob..... ●
L Knob..... S

Following Rows (ORDER ❸)

Stop Knob..... ▼
L Knob..... L

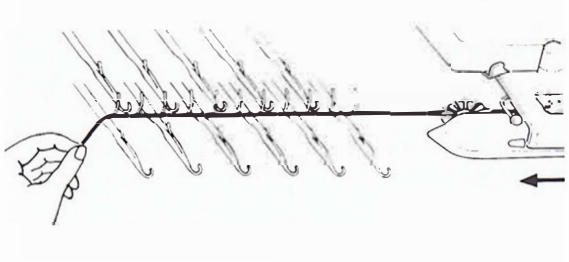


Colours in the L Knob Indicator alternate.

Blue — The current row will be repeated.
Red — The Punch Card moves to the next row and a new pattern row will be knitted next.

Work other operation in the same way as for other types of patterns.

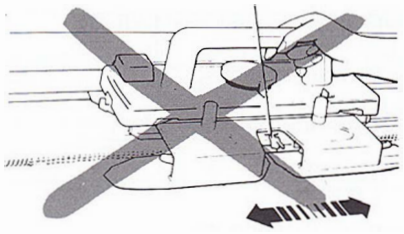
The L Knob can be used, if the Punch Card is suitable for FAIR ISLE, WEAVING, SLIP STITCH and PUNCH LACE.



If cast-on row does not knit properly...

Ensure that the yarn is free from the Round Brush underneath the Arm. The yarn must be under plastic Round Brush Cover.

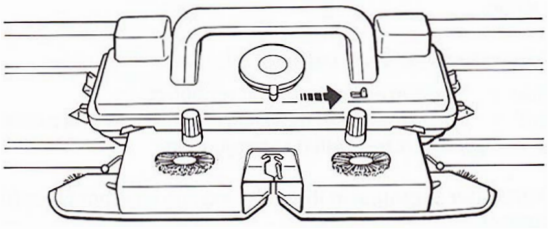
If the yarn is touching the Round Brush, it will be caught in the Brush.



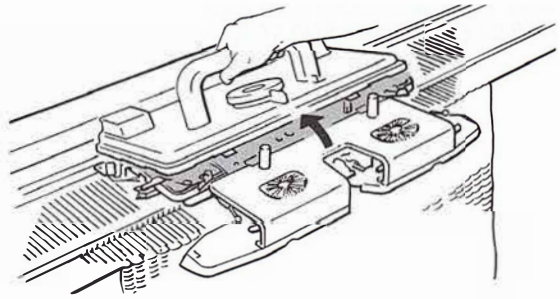
If the Carriage has jammed...

In the middle of the row, do not force the Carriage across the Needle Bed. Proceed as follows to release the Carriage from the jam:

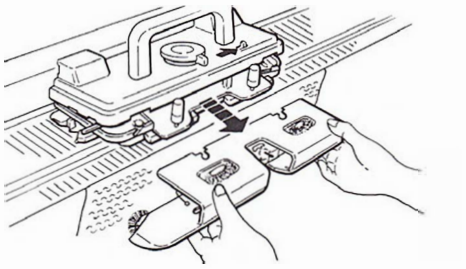
In pattern knitting, set the Stop Knob to ● and remove the Magic Cams if they are in use, before moving the Carriage.



1. Disengage the Row Counter Tripper. Remove the yarn from the Yarn Feeder.
2. Push the Release Lever in the arrow direction.



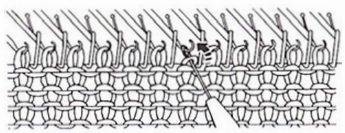
3. With the Carriage Handle lifted, move the Carriage in the same direction to clear the working needles.



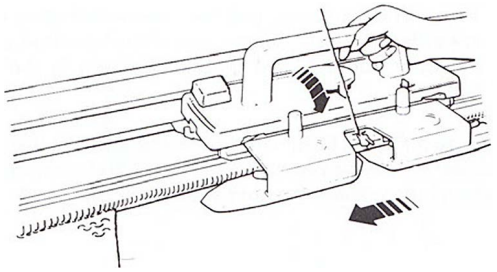
If the yarn is entangled in the Yarn Feeder or Round Brushes, loosen the Arm Nuts and remove the Arm. Then, remove the yarn carefully from the Arm.

4. Pick up any dropped stitches. (See pages 39 ~ 40)

   Push the needles in C or D position back to B position, replacing the stitches in the needle hooks with a Transfer Tool. Unravel the incomplete row and move the Carriage without knitting to the same side as the yarn.



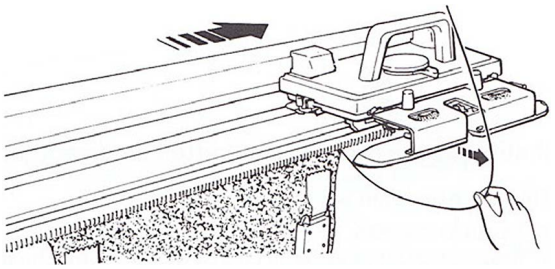
If the Punch Card is in use, memorize the pattern with the Carriage, with the Stop Knob at ●. (See pages 37 ~ 38)



5. Push down the handle until it clicks.

   Make sure the Carriage is clear of the working needles. Engage the Row Counter Tripper.

6. Insert the yarn and continue knitting.

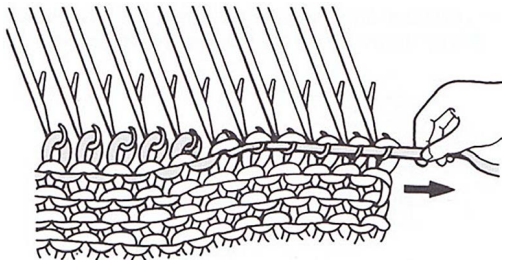


To Unravel the Knitting on the Machine

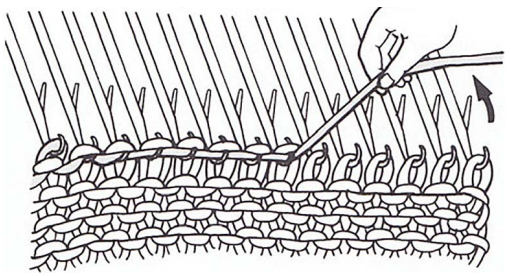
Remove the Carriage from the knitting before you start to unravel. (If the Carriage has jammed, see page 35.)

Remove the yarn from the Yarn Feeder.

Hang the Claw Weights at both edges of the knitting.

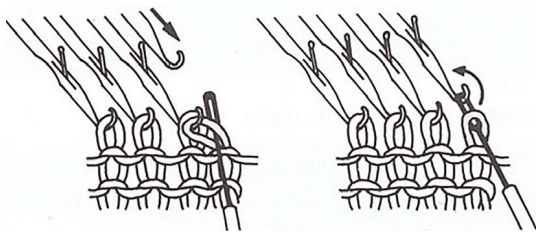


1. Holding the fabric downwards, pull the yarn sideways to tighten the stitches.



2. Lift the yarn upwards and very slightly backwards. The stitches of the previous row will slip back into the needle hooks.

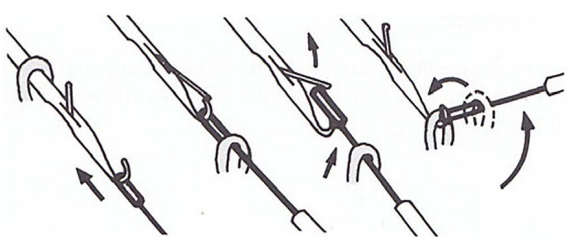
3. Align the needles in B position.



If the fabric has been shaped by decreasing or partial knitting...

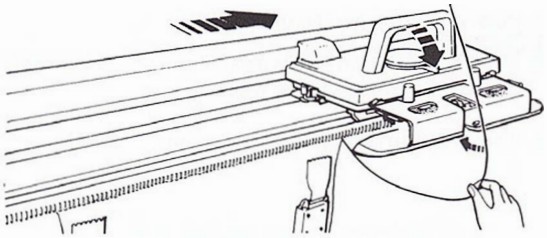
Fabric with decreased edge:

On the decreased edge, the end needle has two stitches. Place one stitch back on its original needle.



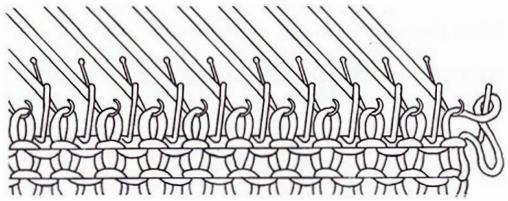
In the course of partial knitting:

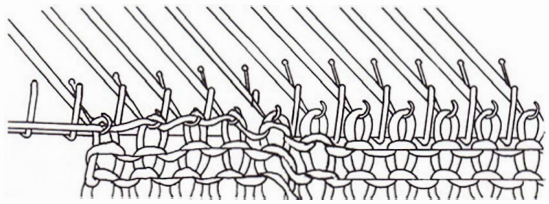
Replace the stitches in the needle hooks. Push the needles in D position back to B position using a Transfer Tool.



4. To continue knitting, pull the unravelled yarn down towards the yarn ball at the back of the Yarn Rod, adjust the Row Counter, and replace the yarn in the Yarn Feeder.

If using a Punch Card, wind back the Card by the same number of rows as you have unravelled, and memorize the pattern before starting to knit. (See pages 37 ~ 38)



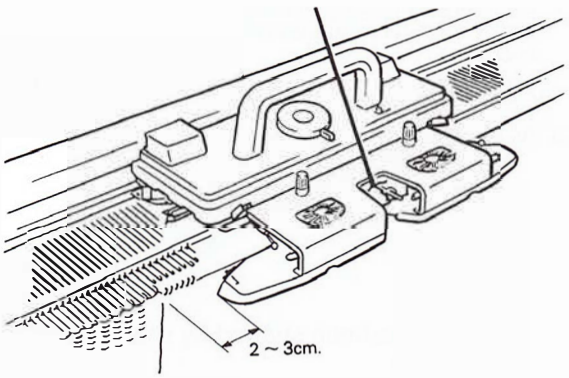


If stitches are dropped or knitted incorrectly...

This can be caused by:

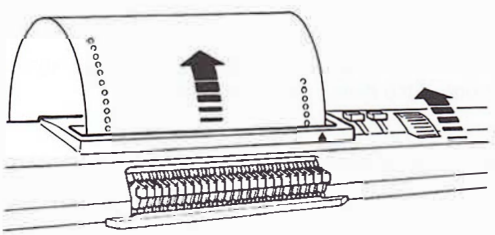
1. Faults in the yarn.
2. Moving the Carriage too far past the edge of the knitting.

Reform dropped stitches using a Transfer Tool (see pages 39 ~ 40) or unravel the row incorrectly knitted (see page 36).



To continue knitting, ensure that:

1. Arm has passed the last knitting needle by 2 ~ 3cm. before knitting the next row.
2. You move the Carriage at an even speed.
3. Yarn is in good condition, with no knots or faults.

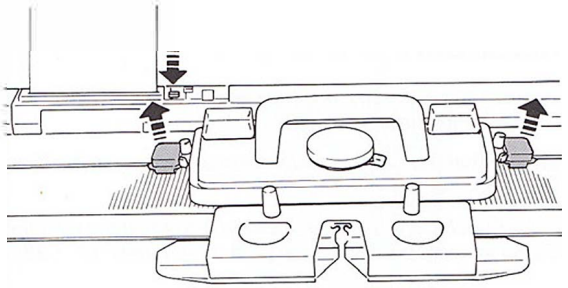


To Memorize the Pattern

Memorizing the pattern is required when:

1. Carriage has been removed from the Needle Bed.
2. Knitting has been unravelled.
3. Yarn is entangled in Memory Drums at the back of the Carriage.

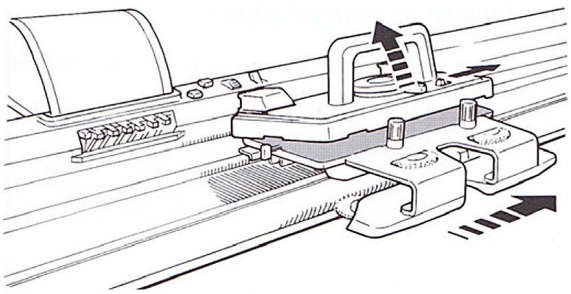
After unravelling, turn back the Punch Card and Row Counter by the same number of rows as you have unravelled.

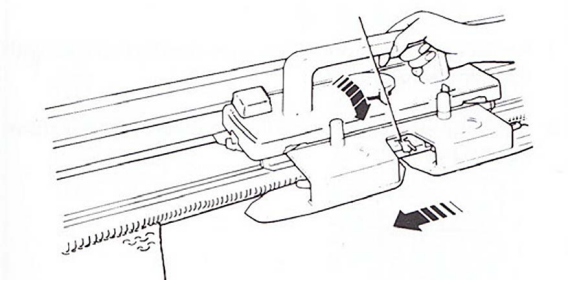


If using L KNOB, return the Punch Card ONLY HALF THE NUMBER of rows as you have unravelled.

e.g. 3 rows incorrectly knitted:

— Unravel 4 rows.
— Wind back the Card by 2 rows.





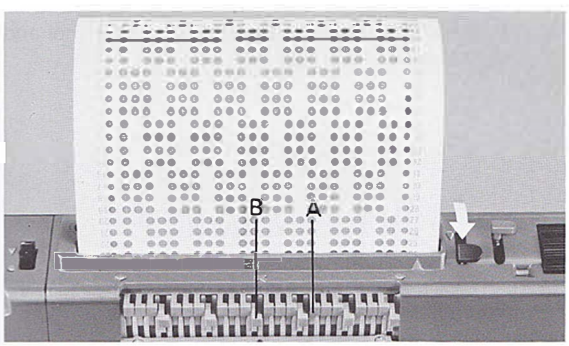
Set the Stop Knob to ● and remove the Magic Cams if they are in use.

Disengage the Row Counter Tripper.

Remove the yarn from the Yarn Feeder.

Push the Release Lever to the right. With the Carriage Handle lifted, move the Carriage once or twice across the Needle Bed until it has passed the 24 needles in front of the Touch Levers. Finish with the Carriage at the same side of the knitting as the yarn.

Replace the yarn in the Yarn Feeder and set the controls to their original positions.

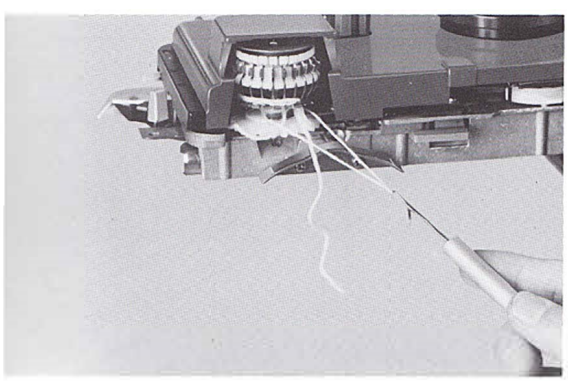


To Check the Pattern With the Card

By setting the Stop Knob to ●, the pattern of the row to be knitted next is shown by the Touch Levers.

To check the pattern on the previous row, wind back the Card by 1 row and set the Stop Knob to ●.

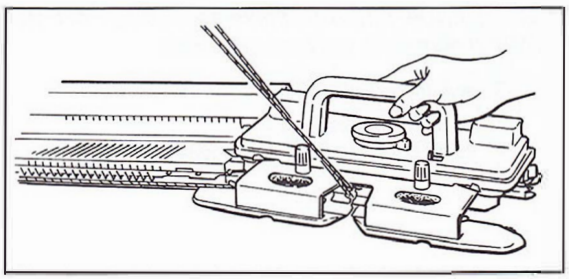
Touch Levers in the back position "A" show the punched area of the Card.
Touch Levers in the front position "B" show the non-punched area of the Card.



If the yarn is entangled in Memory Drums...

If the yarn gets entangled inside the Memory Drums, move the Carriage to the side until the defective drum is off the edge of the Needle Bed and carefully remove the yarn using the Tappet Tool.

If this happens during pattern knitting, memorize the pattern with the Carriage, with the Stop Knob at ●.
(See pages 37 ~ 38)

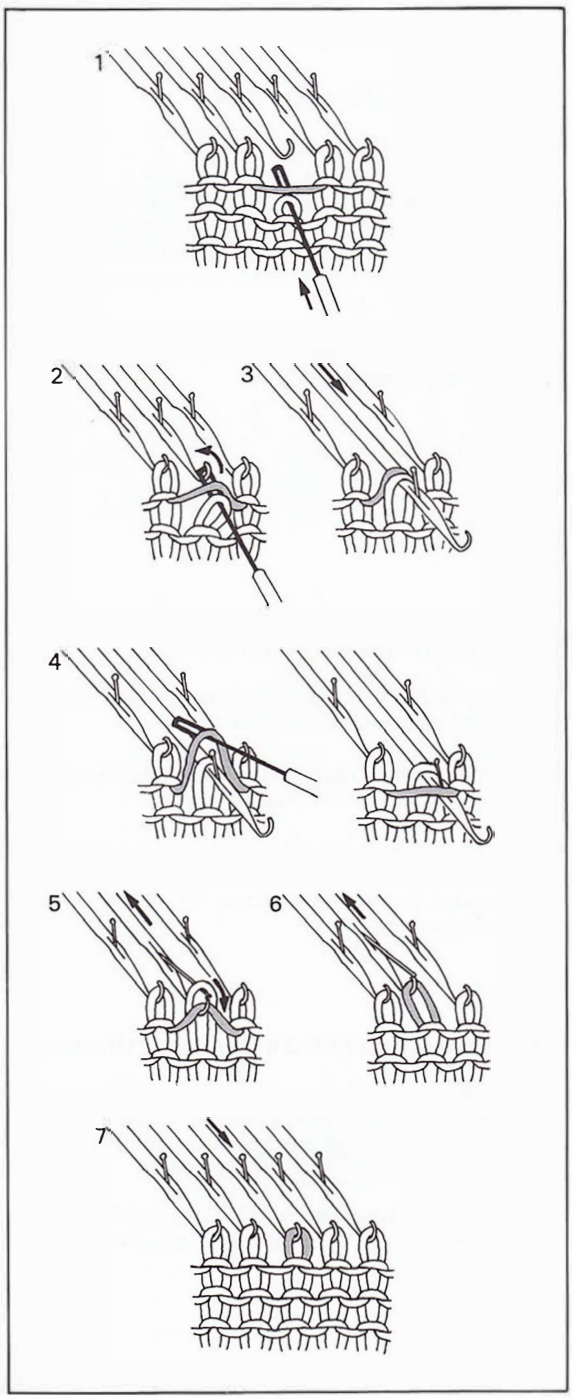


If the Carriage has been removed from the Needle Bed...

Replace the Carriage on the Needle Bed by sliding the Carriage Pipe onto the rail.

Ensure that the Carriage moves smoothly across the Needle Bed.

If the Punch Card is in use, memorize the pattern with the Carriage, with the Stop Knob at ●. (See pages 37 ~ 38)



To Replace a Dropped Stitch

1. Insert a prong of the Transfer Tool into the dropped stitch.

2. Replace the stitch onto the empty needle together with the bar above the stitch.

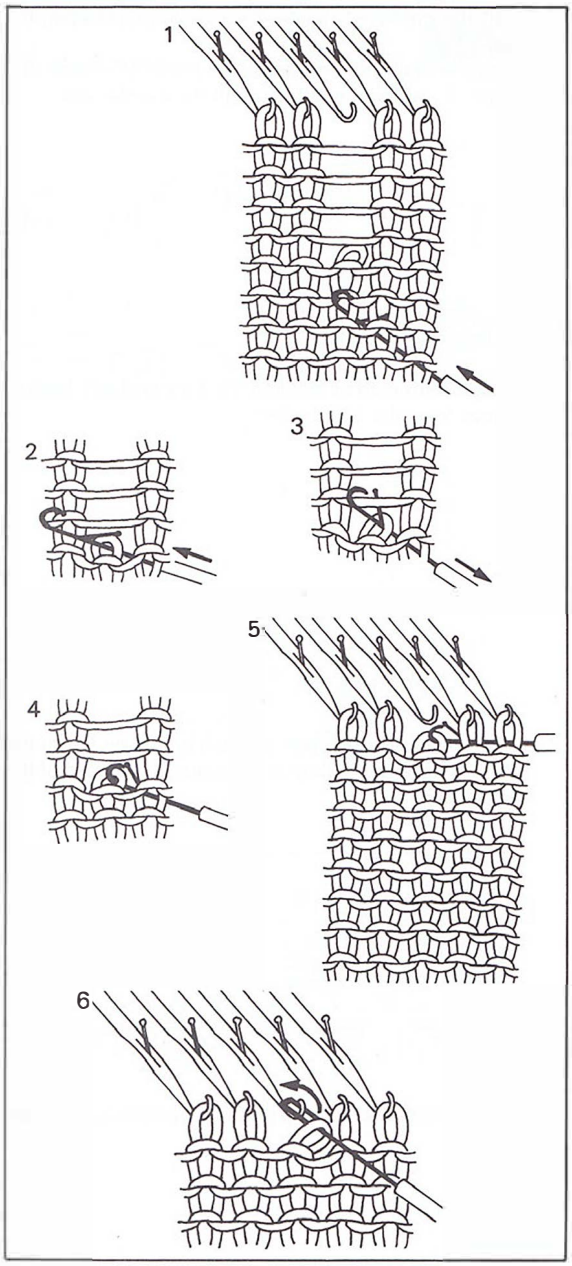
3. Push the needle forward till the stitch and bar move behind the latch.

4. Lift up the bar using a prong of the Transfer Tool and bring it in front of the latch.

5. Push back the needle till the stitch behind the latch slips off the needle.

6. Push the needle back to A position to correct the size of stitch.

7. Align the needle correctly in B position.



If a dropped stitch has run down for several rows...

1. Insert the Tappet Tool from behind into a stitch a few rows below the dropped stitch.

   Let the stitch run down to the Tappet Tool.

2. Push the Tool forward till the stitch moves behind the latch of the Tool.

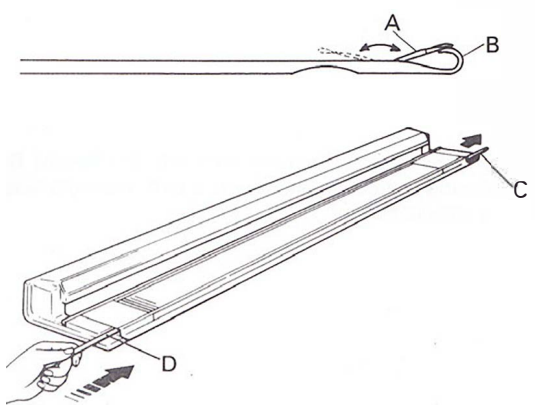
3. Pull the Tool back, catching the bar above.

4. The stitch behind the latch slips off the Tool and knits through the bar in the hook.

5. Repeat up to the top stitch.

6. Take the top stitch onto the Transfer Tool at the front, and replace it in the empty needle hook.

If one or more stitches have dropped or when in pattern knitting, it is usually easier to unravel the rows, rather than to repair the stitches.

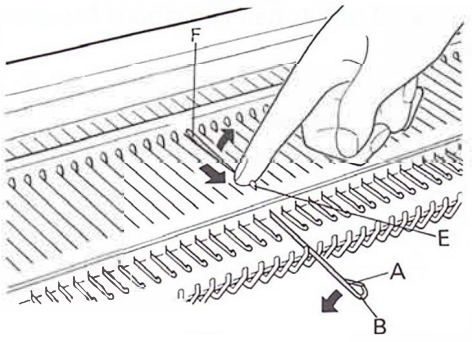


To Replace a Damaged Needle

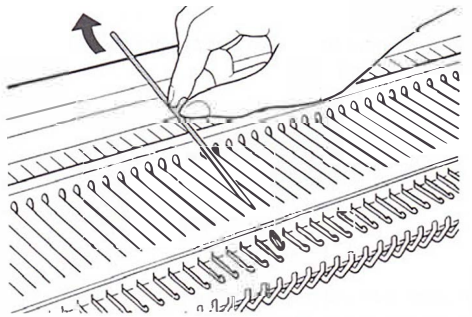
A needle with a damaged latch or a bent hook will cause incorrect knitting or dropped stitches.
The needle latch "A" must move smoothly and lie flat over the hook "B".

1. At each side of the Needle Bed, you can see the Needle Retainer "C".

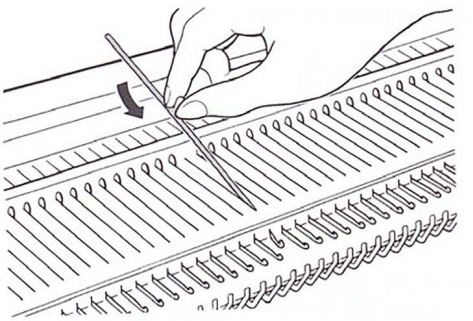
   If the damaged needle is at the left of Needle Bed, move the Carriage to the right. Use a pencil "D" to push the Needle Retainer from the left. The tip of the Needle Retainer will appear at the other end of the Needle Bed. Pull the Needle Retainer from the right until the damaged needle is free. Don't pull too far.



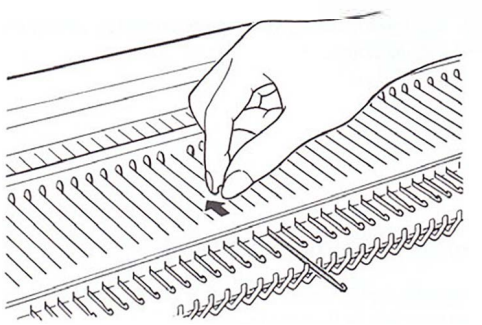
2. Push the damaged needle to D position, pressing the butt "E".
   Close the latch "A" and press the hook "B" down. The shank "F" will come out through the needle slot.



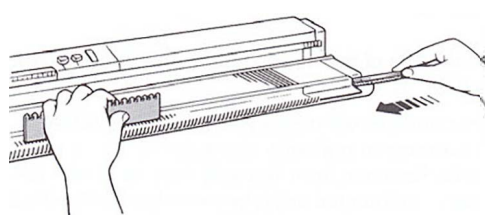
3. Lift up the needle by holding the butt and pull back to remove from the Needle Bed.



4. To fit a new needle, open its latch and slide it into the needle slot until the hook comes out of the front of the Needle Bed.

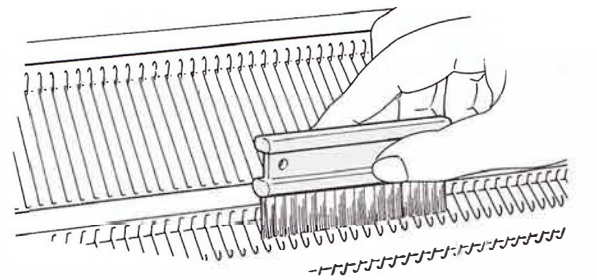


5. Push the needle back to A position by holding the butt.



6. Push the Needle Retainer back into the Needle Bed, pressing floated needles down with the straight side of the Needle Pusher.

MAINTENANCE

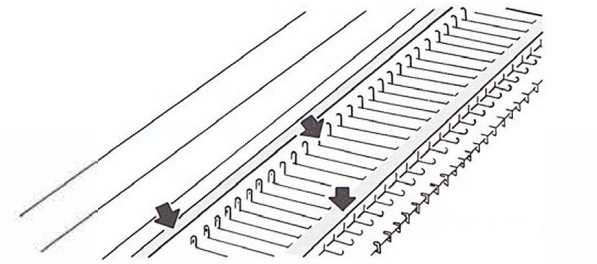


Clean and oil your machine periodically. It is recommended that you should clean the machine after knitting every garment

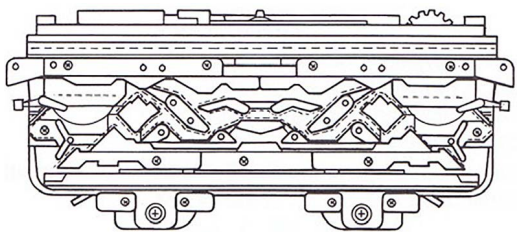
Needle Bed

Remove the Carriage from the Needle Bed.

Using the Cleaning Brush, remove all fluff from the needles and the Needle Bed.



With a soft, oiled cloth, wipe the needle butts, rail, and front guide of the Needle Bed.



Carriage and Arm

Remove the Arm from the Carriage.

Turn over the Carriage. Brush free all fluff from the cams, Carriage pipe, slider, and other metal parts, then wipe off old oil. Lublicate them with a soft, oiled cloth. (Dotted lines show the oiling surfaces.)

Turn over the Arm and brush off all fluff. Using the Tappet Tool, remove any yarns and fluff from the Round Brushes or Fabric Gears so that they are free to rotate. If necessary, remove those brushes or gears to remove yarn fibers trapped under them.

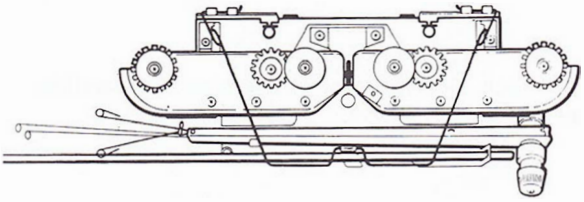
IMPORTANT!

Do not apply oil straight from the bottle.

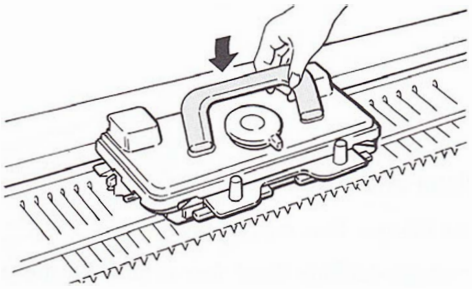
REPACKING THE MACHINE

Replace the accessories into the Accessory Box.

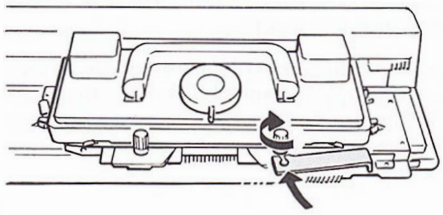
Remove the Punch Card from the Pattern Panel.
Do not fold or bend it.



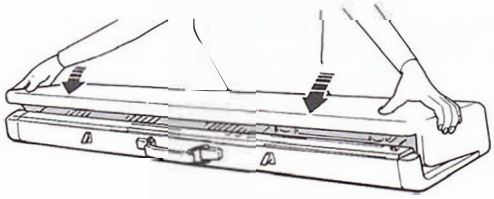
Remove the Auto Tension and Arm from the Knitter and pack them inside the Top Cover.



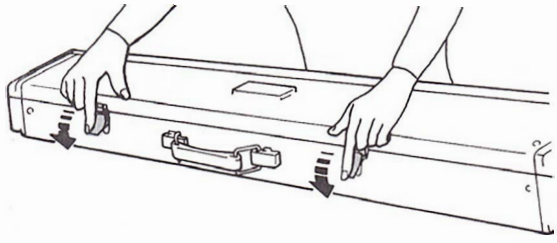
Lay the Carriage Handle down.



Secure the Carriage to the Needle Bed with the Carriage Fastener.



Place the Top Cover onto the Needle Bed.



Fasten the latches.

TO STORE THE MACHINE

Keep the machine away from:

1. Too much moisture.
2. Abnormal change of temperature.
3. Salt or chemicals.

INSTRUCTION FOR KNITTING

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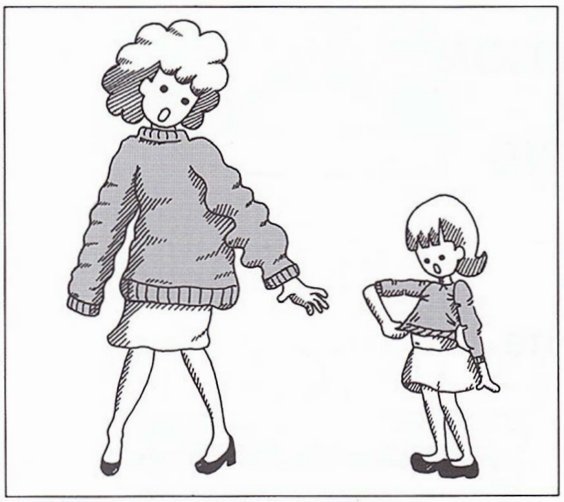
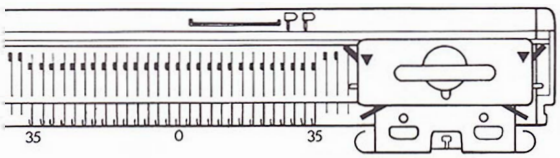
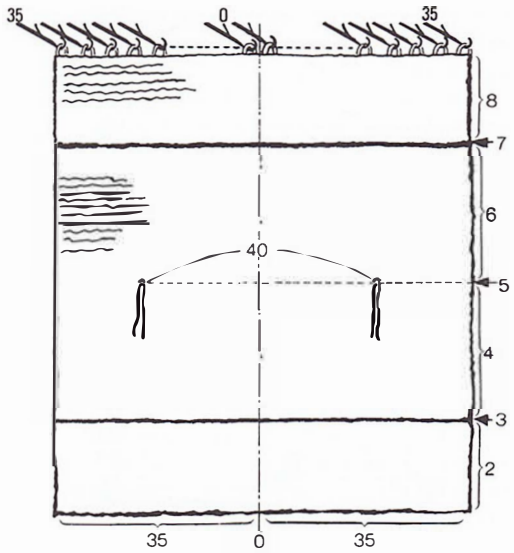
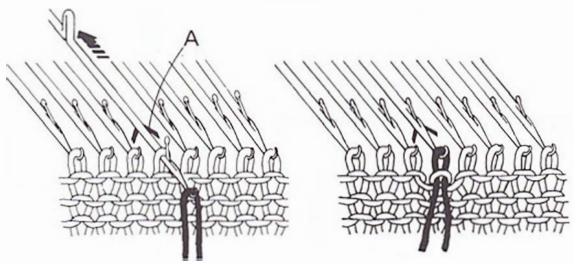
TAKING A TENSION GAUGE









Tension Gauge

Tension Gauge indicates how many stitches you need to cast on, and how many rows you need to knit to make a 10cm. square. It is very important to take a correct tension gauge to knit a garment in your desired size.

To take a correct tension gauge, the tension swatch must be knitted in the same stitch pattern, with the same yarn and Stitch Dial number as to be used for the garment.

To Knit a Tension Swatch

Prepare the yarn you selected and a small amount of contrast yarn for marking the swatch.
Decide on the Stitch Dial number referring to page 9. It is recommended that you try different Stitch Dial settings till you obtain a suitable tension for the yarn and stitch pattern chosen.

Knit the swatch as instructed below.

1. Push 35 needles on both sides of centre(0) to B position, 70 needles altogether. Cast on with main yarn.

2. Knit 20 rows in selected stitch pattern, with Stitch Dial on setting chosen.

3. Change to the contrast yarn, and knit 2 rows in Stockinet.

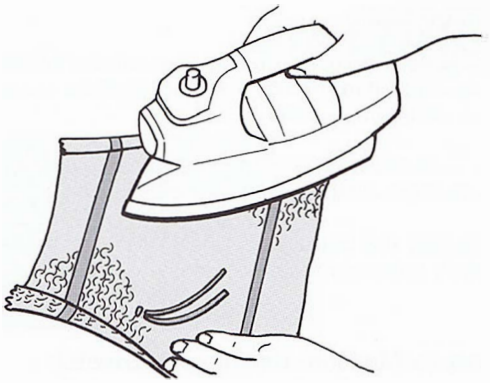
4. Remove contrast yarn and rethread main yarn. Knit 30 rows in selected stitch pattern with correct Stitch Dial setting.

5. Push both 21 st needles (Λ mark "A" on the Needle Bed) from the centre(0) to D position and place a piece of contrast yarn in each of the needle hooks.
   Push the needles back to B position by hand.

6. Knit another 30 rows.

7. Thread contrast yarn and knit 2 rows in Stockinet.

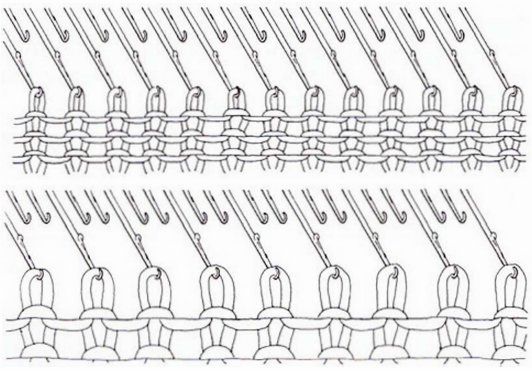
8. With main yarn, knit 20 rows in selected stitch pattern and remove the swatch from the machine.



IMPORTANT!

Allow the swatch to rest for several hours, to return to its natural condition, after being stretched on the machine. Press lightly with a steam iron, or with an ordinary iron over a damp cloth. Allow to dry before taking tension gauge.

Make a note of the Stitch Dial number.



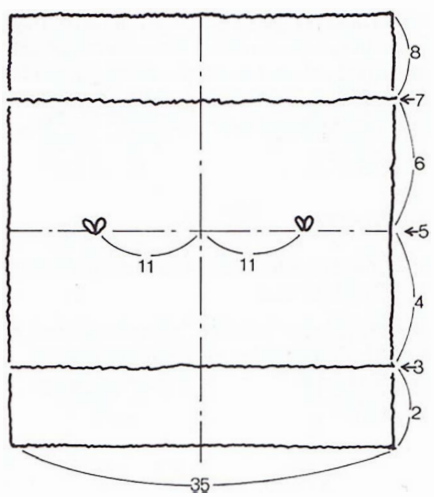
When knitting with very thick yarn...

Every alternate or every third needle selection is necessary for very thick yarn.

Select a suitable Punch Card if pattern knitting.

Knit the tension swatch (e.g. every alternate needle selection) in the following way:

1. Push 35 needles on both sides of centre(0) to B position. Push every alternate needle back to A position using the 1/1 Needle Pusher. The needles are arranged as shown below.

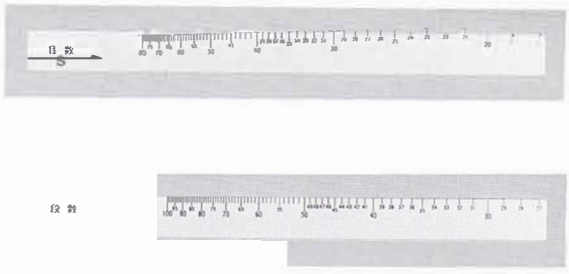


2. Using main yarn, cast on and knit, checking tension on the fabric, till you obtain a Stitch Dial number suitable for the stitch pattern and yarn chosen.
   Knit 10 rows.
3. With contrast yarn, knit 2 rows in Stockinet.
4. With main yarn, knit 15 rows.
5. Push the 11th working needle on both sides of centre(0), marked by the arrows as shown above. Lay a contrast yarn in the needle hooks, and push the needles back to B position.
6. Knit another 15 rows with main yarn.
7. With contrast yarn, knit 2 rows in Stockinet.
8. With main yarn, knit another 10 rows and remove the swatch from the machine.

IMPORTANT!

The fabric is stretched widthways on the machine. Roll the knitting into a tube, from side to side, and pull lengthways to close up the stitches.

Make a note of the Stitch Dial number.

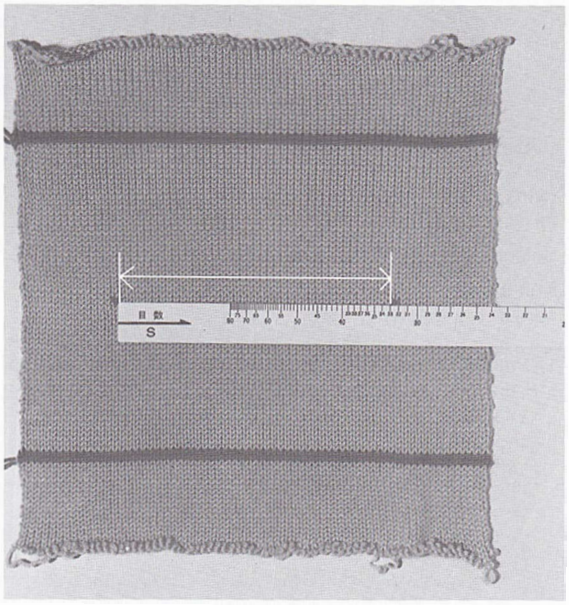


Gauge Scale

This scale is designed to count the number of stitches and rows required to knit 10cm. measuring between contrast yarn marks on the tension swatch.

The scale has two sides. The side "S" is used for measuring stitches and the side "R" is for rows.

Following the instructions below, measure the tension swatch to obtain the correct Tension Gauge.



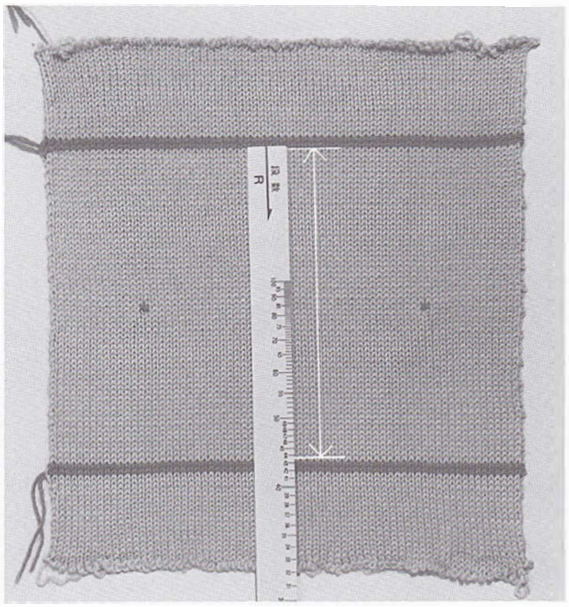
How to Measure the Tension Swatch

Stitches (Horizontal)

Use the Gauge Scale (green) with the "S" side up.

Place the arrow end of the scale inside the left-hand contrast stitch. Measure to the inside of the right-hand contrast stitch. The number at this point indicates how many stitches are required to knit 10cm.

The scale should be used from the edge marked with the arrow, i.e. from the left edge (arrow end).



Rows (Vertical)

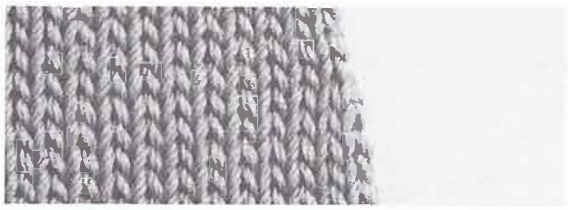
Use the Gauge Scale (green) with the "R" side up.

Place the arrow end of the Scale at the top of the tension swatch, just below the rows knitted in contrast yarn. Measure to the inside of the two contrast rows at the bottom of the tension swatch. The number at the point indicates how many rows are required to knit 10cm.

IMPORTANT!

The above measurements (number of stitches/rows) are called TENTION GAUGE.

Make a note of the Tension Gauge together with the relative Stitch Dial Number for future reference.

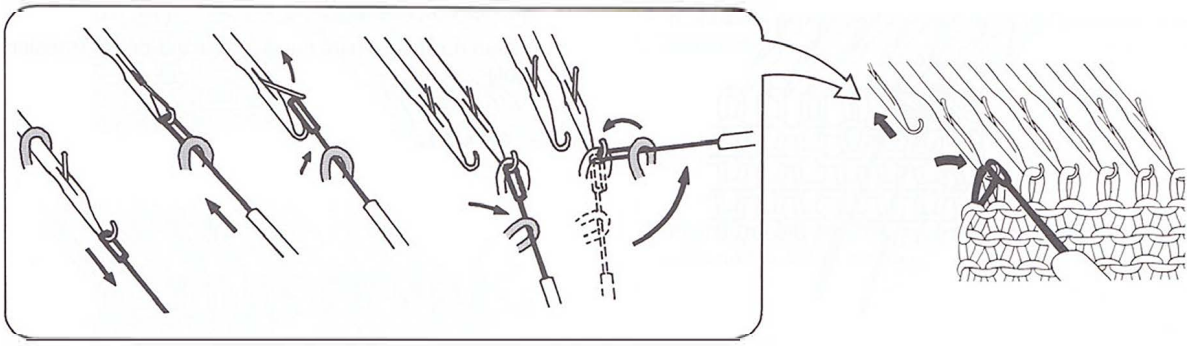


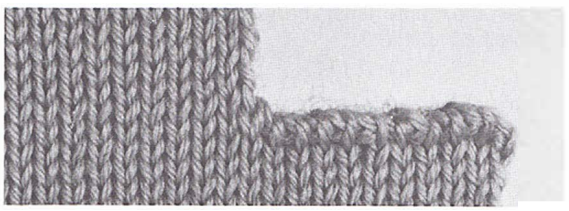
Decreasing 1 Stitch

You can decrease 1 stitch at both sides of the same row.

Using a Transfer Tool, transfer the end stitch onto its adjacent needle.

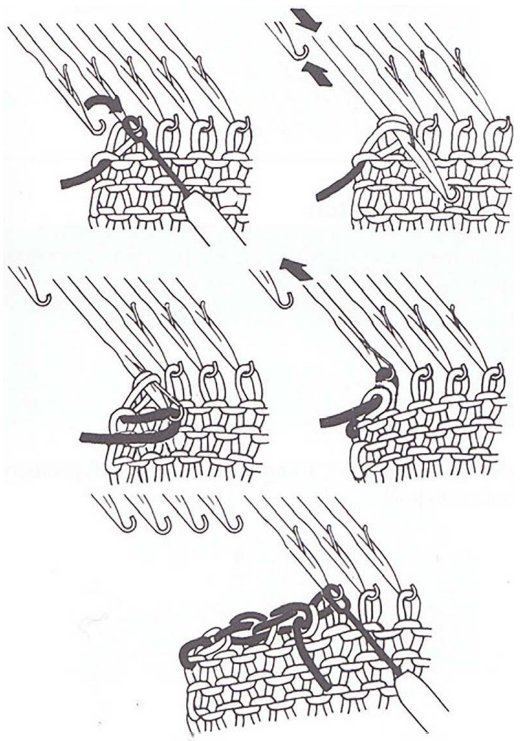
Push the empty needle back to A position.
Continue to knit.





Decreasing Multiple Stitches

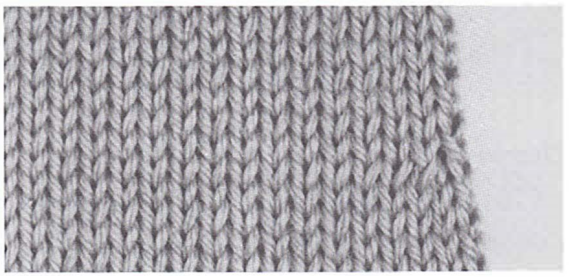
You can decrease only on the Carriage side.



To decrease at the left edge:

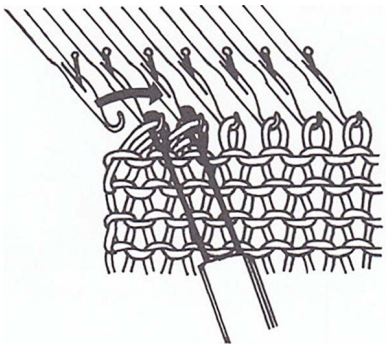
1. With the Carriage at the left, hold the fabric back against the Knitter.
   Transfer the end stitch to its adjacent needle. Push the empty needle back to A position.
2. Push the second needle to D position until both stitches are behind the latch.
3. Lay the yarn from left to right in the open hook of the needle. (When decreasing at the right edge, lay yarn from right to left.)
4. Hold the yarn slightly down and push the needle back to B position.
   The two stitches slip off the needle, leaving a new stitch.
5. Continue the same procedure until the required number of stitches have been decreased.
   Place the last decreased stitch onto its adjacent needle.
   Continue to knit.

* Repeat in reverse to decrease at the right.



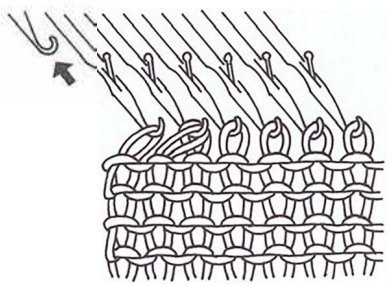
Fully Fashioned Decrease

It is possible to decrease 1 stitch at both sides of the row at the same time.

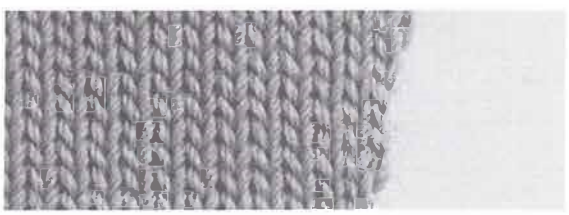


1. With a 2-prong Transfer Tool, transfer the two end stitches one needle in.

   (When using alternate needles, use a 3-prong Transfer Tool.)

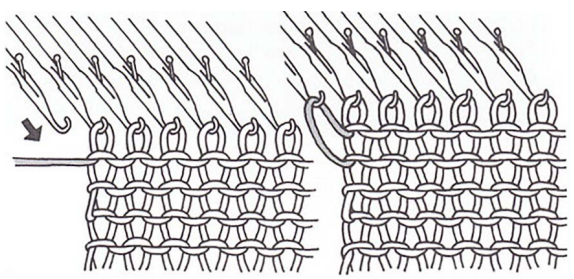


2. Push the empty needle back to A position.
   Continue to knit.

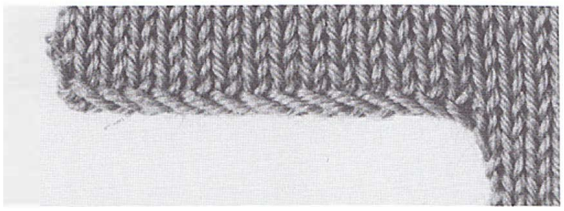


Increasing 1 Stitch

You can increase 1 stitch at a time only on the Carriage side of the knitting.

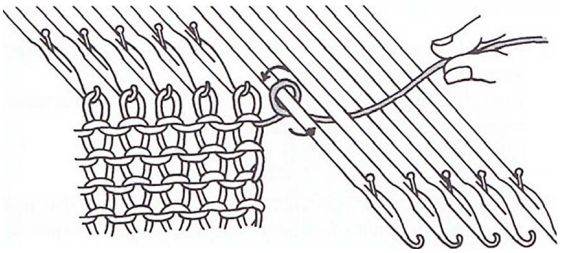


Push 1 needle at the Carriage side from A to B position.
Continue to knit.



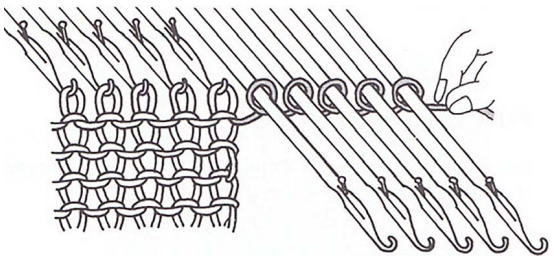
Increasing Multiple Stitches (Main Carriage only)

You can increase only on the Carriage side.

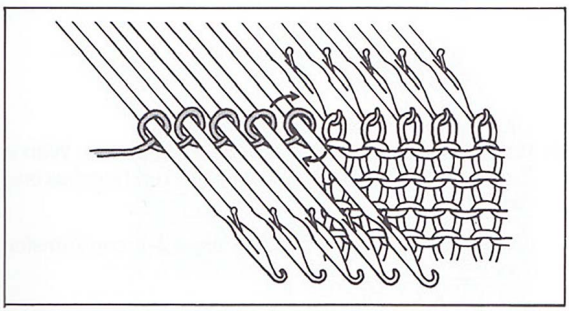


When the Carriage is at right side:

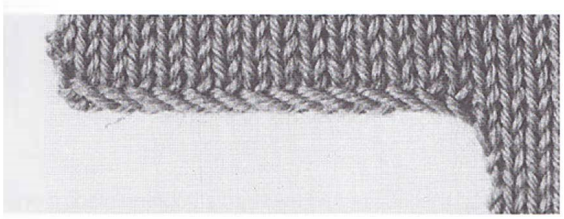
1. Push the required number of needles from A to D position. Pull some yarn from the Yarn Feeder and wind it loosely around the needles in D position anti-clockwise.



2. Push the loops against the sinker posts. Eliminate slack yarn and continue knitting.

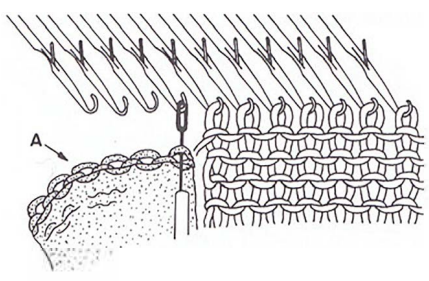


(When the Carriage is at the left side, wind yarn around needles clockwise.)

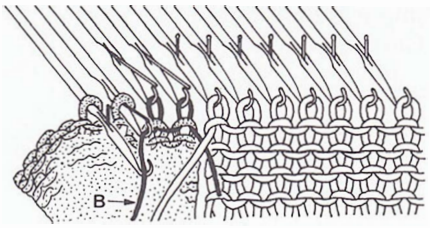


Increasing Multiple Stitches (for Lace Carriage)

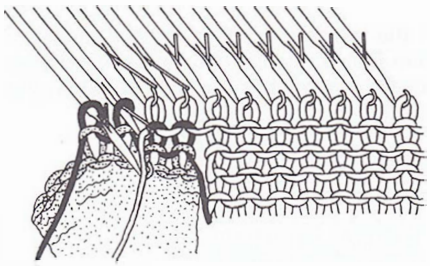
You can increase only on the Carriage side.



1. Push the required number of needles from A to B position.
   Take a piece of waste knitting "A", and using a Transfer Tool, pick up stitches from it and hook them on the needles.



2. Push the needles from B to D position and lay the Ravel Cord "B" in the needle hooks.
(Stitches of the knitted piece must be behind needle latches.)
Push the needles back to B position one by one to form loops.

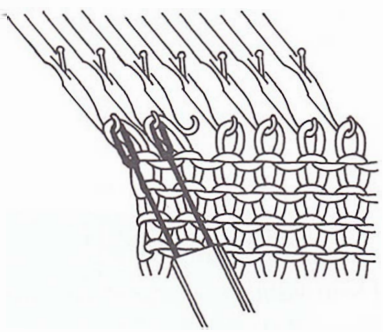


3. Push the needles from B to D position and lay the main yarn in the needle hooks.
Push the needles one by one to form loops in the same way as for the Ravel Cord.
Knit the required number of rows.

4. Before removing the Ravel Cord, backstitch through stitches immediately above the cord. (See pages 63 ~ 64)

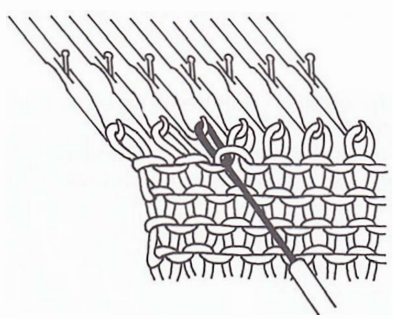
Fully Fashioned Increase

It is possible to increase 1 stitch at both sides of the row at the same time.

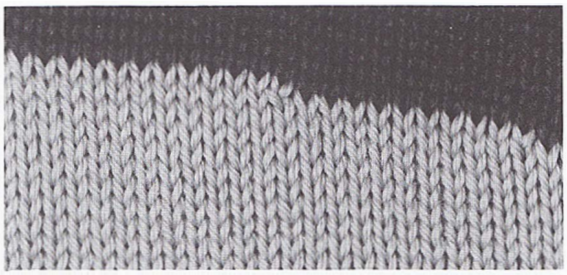


1. Push the adjacent empty needle to B position. With a 2-prong Transfer Tool, transfer the two end stitches one needle out.

   (When using alternate needles, use a 3-prong Transfer Tool.)



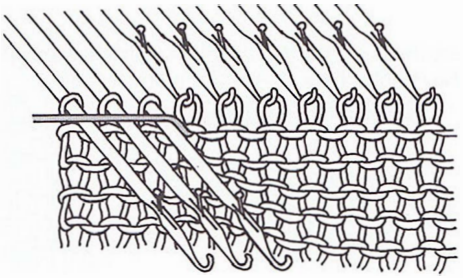
2. Pick up the loop below the third stitch and place it onto the empty needle as shown.
Continue to knit.



Partial Knitting

PARTIAL KNITTING is used to shape a gentle slope, such as shoulders, darts, etc.

You can work partial knitting only at the opposite end to the Carriage. If you wish to shape both sides, work left and right alternately.

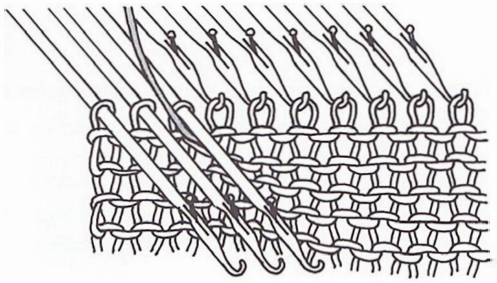


Decreasing Stitches (Main Carriage only)

Set the Russel Levers to **I**.

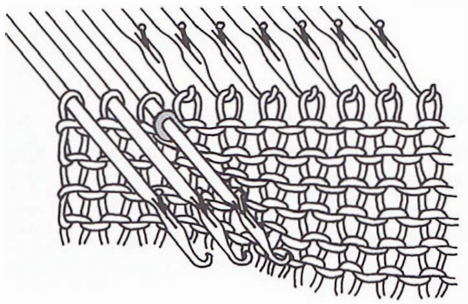
1. Push the needles to be decreased to D position at the opposite end to the Carriage.

2. Knit 1 row.
   The needles in B position knit. The needles in D posiiton remain inactive and the yarn passes over them.



3. To prevent a hole from being formed in the fabric, pass the yarn under the first inside needle in D position and over the remaining needles.

   (If partial knitting is required at both sides, repeat step 1 before knitting the next row.)

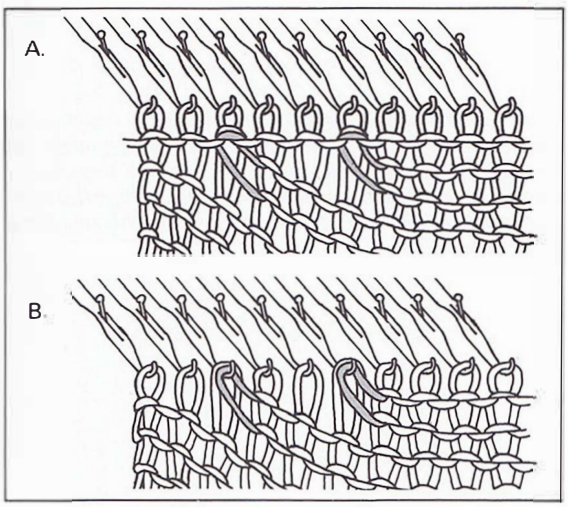


4. Knit 1 row.
   This completes the first operation of partial knitting.

   (If partial knitting is required at both sides, apply step 3.)

5. Repeat steps 1 ~ 4.

*After completing partial knitting, continue as follows:



A. Stockinet

Push the needles in D position at the opposite end to the Carriage back to C position.

Knit 1 row. The needles in C position will knit and return to B position.

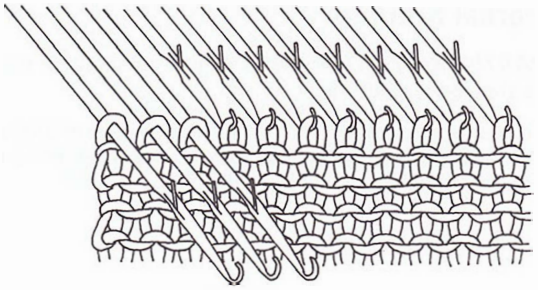
Repeat this step if partial knitting has been worked at both ends.

B. Pattern knitting

Using a Transfer Tool, return the needles in D position to B position, at the opposite end to the Carriage.

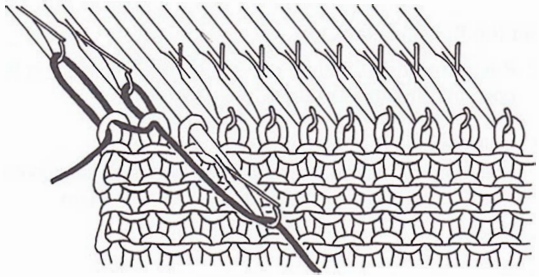
Knit 1 row.

Repeat this step if partial knitting has been worked at both ends.

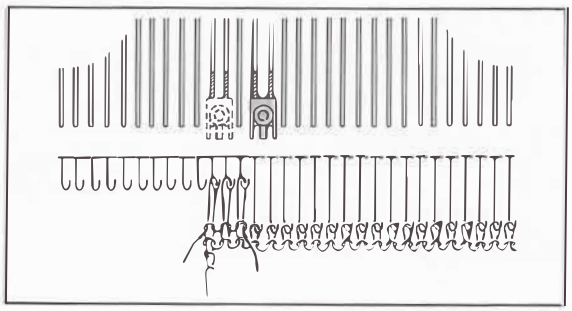


Decreasing Stitches (for Lace Carriage)

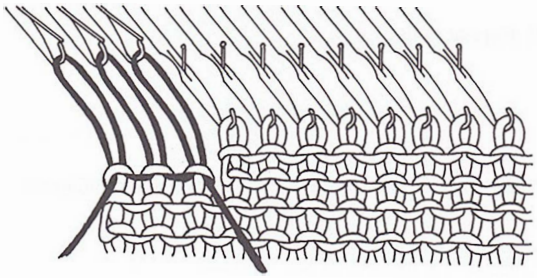
1. Push the needles to be decreased to D position at the opposite end to the Carriage.



2. Lay the Ravel Cord in the open needle hooks, and push the needles back to A position one by one.



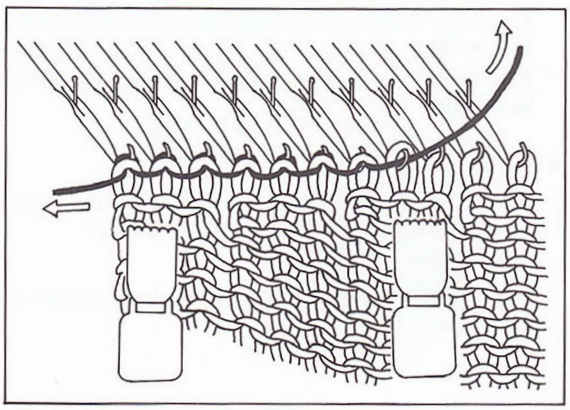
3. Replace the Edge Pin over the two end needles in B position.



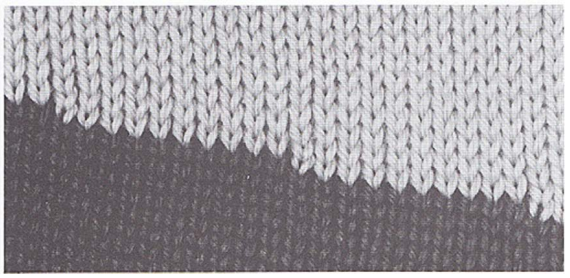
4. Knit 2 rows.

   (If partial knitting is required at both sides, knit 1 row only, then repeat steps 1 ~ 3. Knit 1 row.)

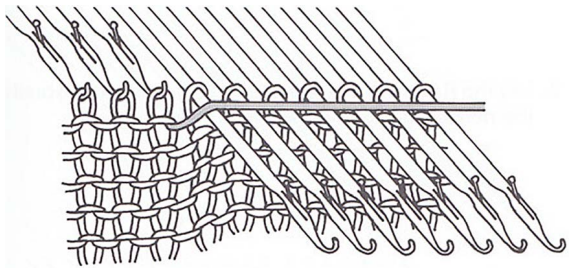
5. Repeat steps 1 ~ 4.



After completing the partial knitting, hang the weights and replace the stitches in the needle hooks by pulling the Ravel Cord at the opposite end to the Carriage. Replace the Edge Pins over two end needles. If partial knitting has been worked at both sides, knit 1 row, then repeat this step at the other side.



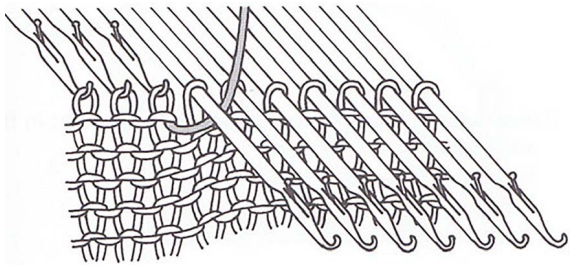
Increasing Stitches (Main Carriage only)



Set the Russel Levers to **I**.

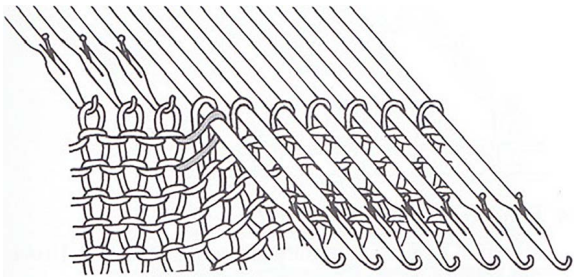
1. Push the required number of needles to D position at the opposite end to the Carriage.

2. Knit 1 row.
   The needles in B position knit. The needles in D position remain inactive and the yarn passes over them.



3. To prevent a hole forming, pass the yarn under the first inside needle in D position and over the remaining needles.

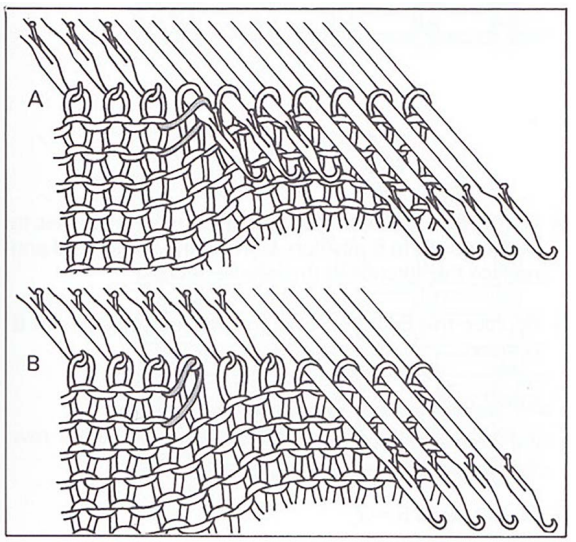
   (If partial knitting is required at both sides, repeat step 1 before knitting the next row.)



4. Knit 1 row.

   (If partial knitting is required at both sides, apply step 3.)

5. Before knitting the next row, work on the side opposite the Carriage as follows:



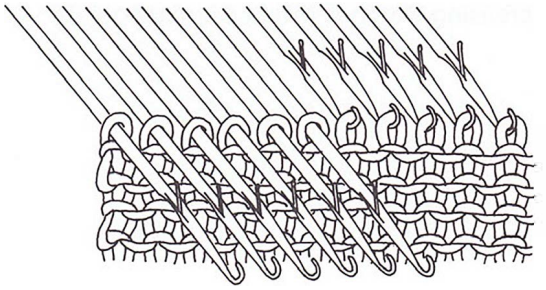
A. Stockinet

Push the needles to be increased back to C position.

B. Pattern knitting

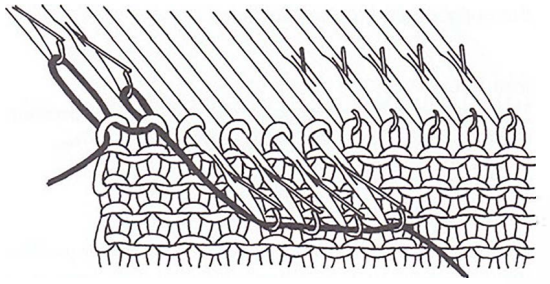
Using a Transfer Tool, return the needles to be increased to B position. Align the needles correctly in B position.

6. Repeat steps 2 ~ 5, but if partial knitting has been worked at both sides, repeat steps 2, 3 and 5 only.

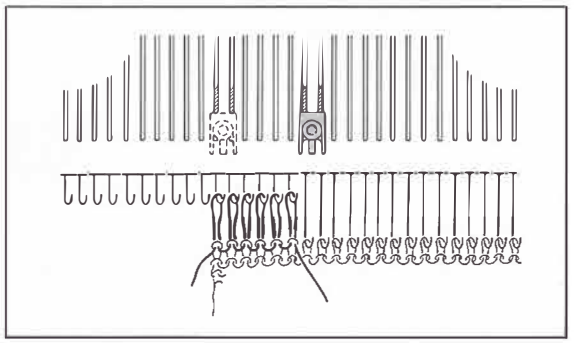


Increasing Stitches (for Lace Carriage)

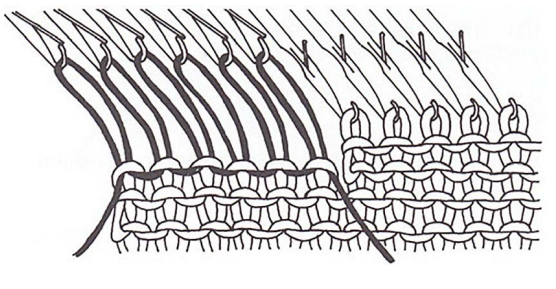
1. Push the required number of needles to D position at the opposite end to the Carriage.



2. Lay the Ravel Cord in the open needle hooks and push the needles back to A position one by one.

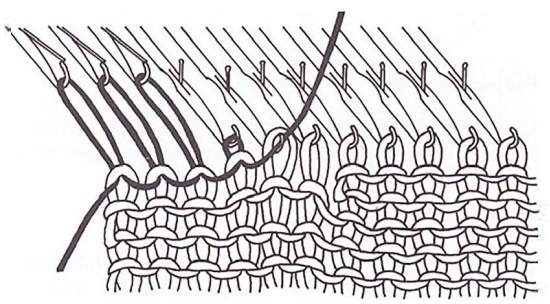


3. Replace the Edge Pin over the two end needles in B position.



4. Knit 2 rows.

   (If partial knitting is required at both sides, knit 1 row only, then repeat steps 1 ~ 3. Knit 1 row.)



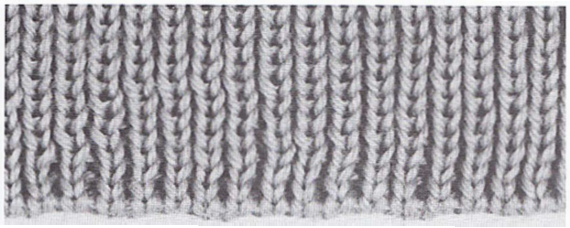
5. On the side opposite the Carriage, push the needles to be increased to B position. Unravel the Ravel Cord and replace the stitches in the needle hooks.

6. Replace the Edge Pin over the two end needles in B position.

7. Knit 2 rows.

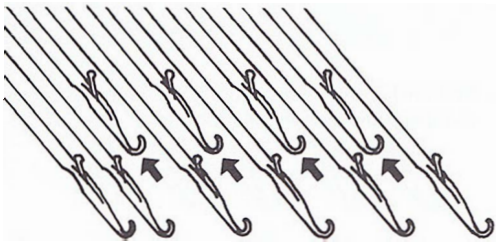
   (If partial knitting is required at both sides, knit 1 row only.)

8. Repeat steps 5 ~ 7.

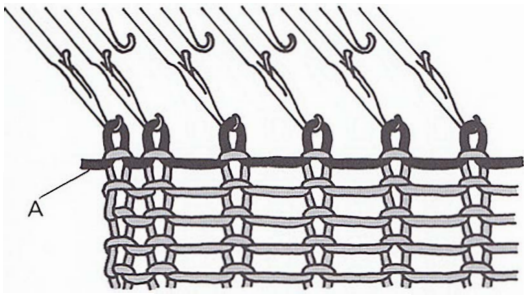


K1.P1. Rib

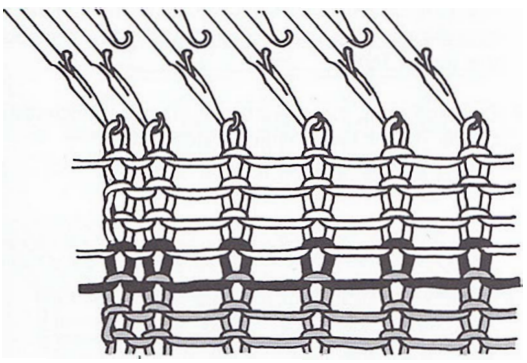
If you don't have a Ribber, this method of knitting ribs can be used for knitting cuffs, neckbands and welts.



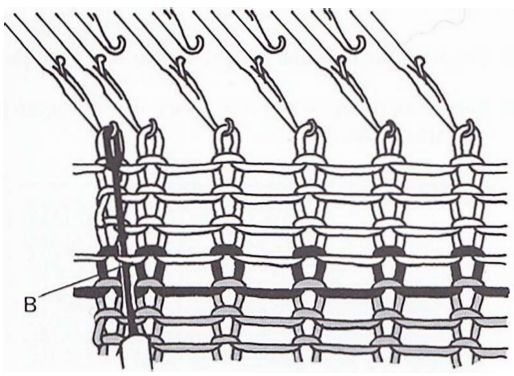
1. Push the required number of needles to B position. Push back every alternate needle to A position, starting with the third needle from the left side.



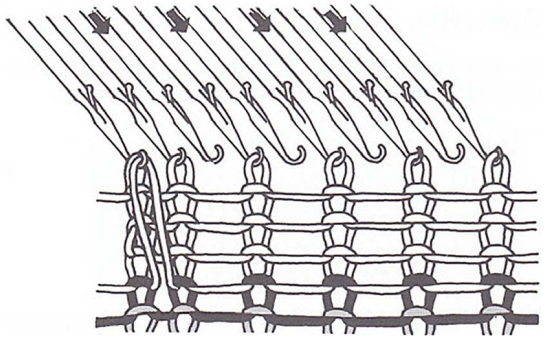
2. Cast on and knit several rows with waste yarn. Hang the Claw Weights at both edges of the knitting. Knit 1 row with the Ravel Cord "A".



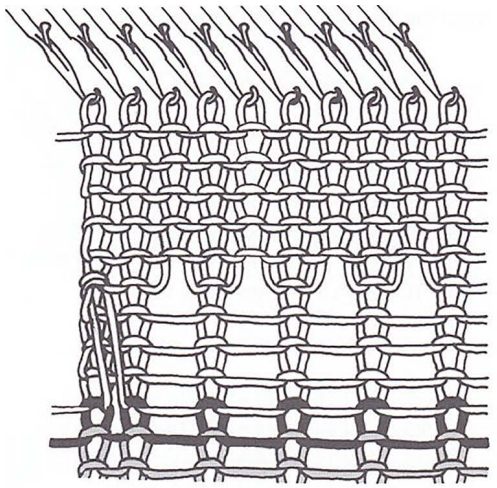
3. Thread main yarn. Knit 4 rows with Stitch Dial at 0.



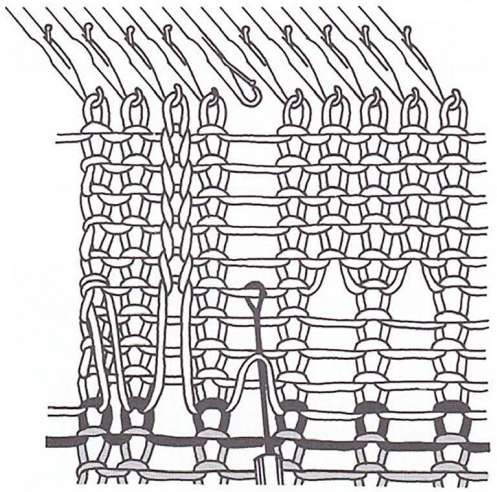
4. Insert the Transfer Tool into the left end sinker loop "B" on the first row of the main knitting. (Above the Ravel Cord)



5. Place the loop onto the end needle. Re-align the needles previously pushed back to A position, in B position.

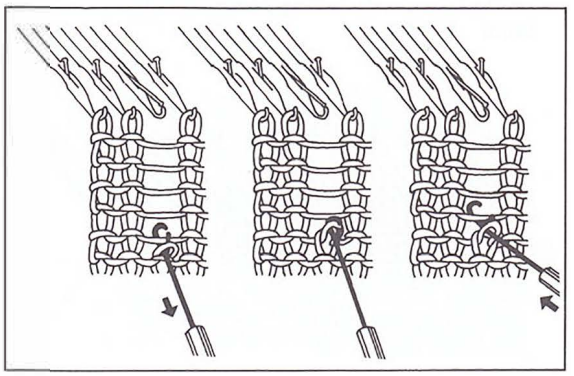


6. Knit the length required for ribbing with the Stitch Dial 2 numbers lower than for Stockinet.



7. Insert the Tappet Tool into the loop of the first row of main knitting and unravel the stitches as shown. Skip over the next 3 rows and catch the 5th bar in the hook of the Tappet Tool.

8. Pull the Tappet Tool towards you. The first stitch will slip off the Tappet Tool, forming a new stitch.



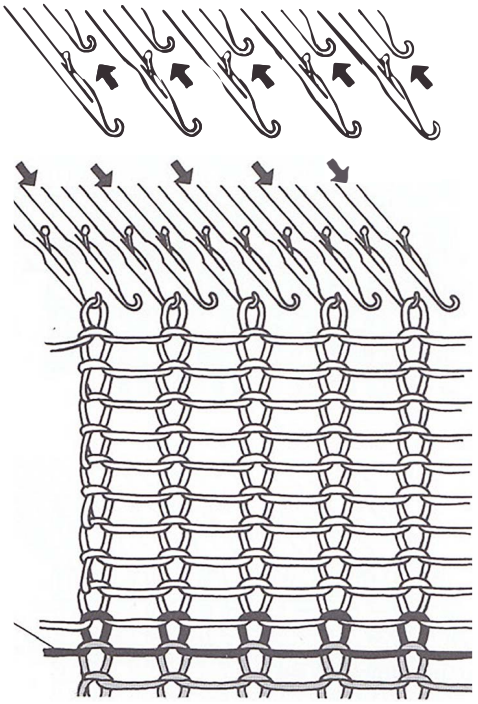
9. Catch the next bar and pull the Tappet Tool towards you.

10. Repeat step 9 on every row. Place the last stitch back onto its needle.

*Reform every alternate stitch as above.

Mock Rib

Mock rib can be used instead of K1. P1. Rib.



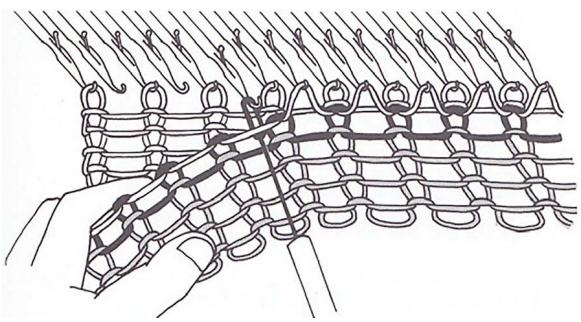
1. Push the required number of needles to B position. Push every alternate needle back to A position, starting with the second needle from the left side.

2. Cast on and knit several rows with waste yarn.

   Knit 1 row with the Ravel Cord "A".

3. Thread main yarn and set the Stitch Dial 3～4 numbers lower than for Stockinet, and knit twice the number of rows required for the depth of the welt.

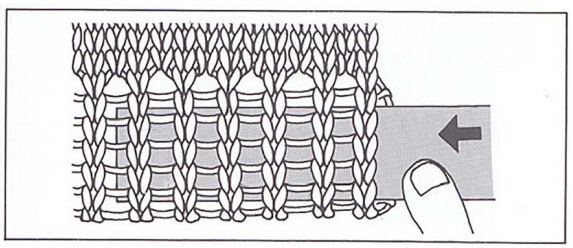
4. Re-align the needles previously pushed back to A position, in B position.



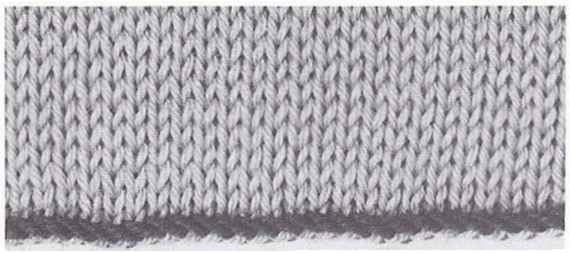
5. Using a Transfer Tool, pick up the sinker loops on the first row of the main knitting above the Ravel Cord and place them onto the empty needles in B position.

6. Reset the Stitch Dial to the number used for Stockinet and continue to knit.

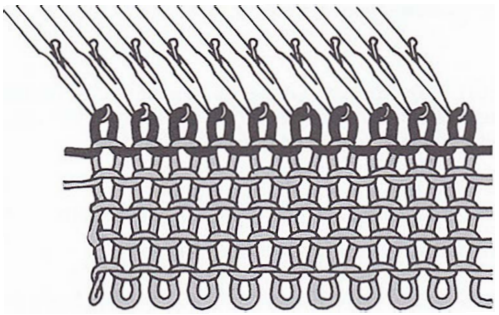
   Pull out the Ravel Cord to remove the waste knitting.



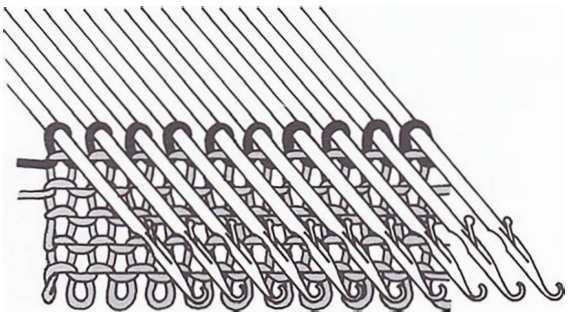
When pressing, insert a ruler into the side opening of the welt and pull the fabric vertically, to close up the stitches.



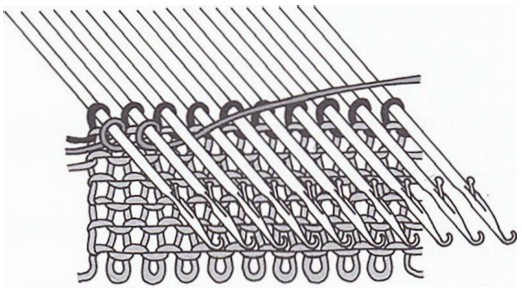
Cast-on by Winding Yarn



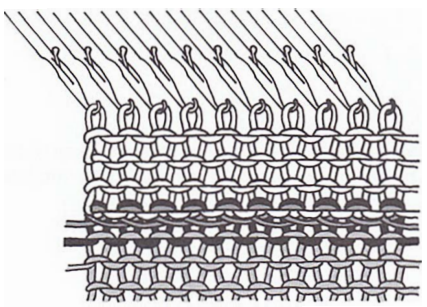
1. Cast on with waste yarn and knit several rows, ending with the Carriage at the left. Knit 1 row with the Ravel Cord.



2. Push the needles to D position.



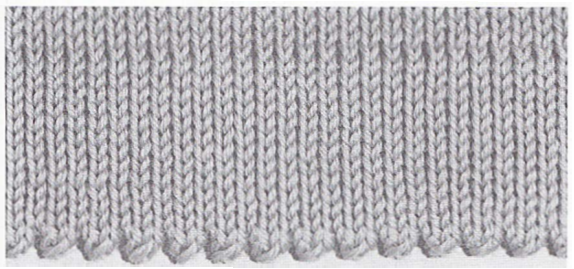
3. Wind main yarn around the needles anticlockwise, starting from the left.

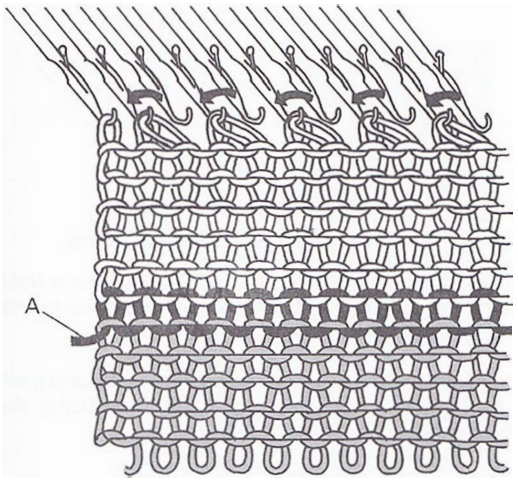


4. Thread main yarn into the Yarn Feeder.
5. Set both Russel Levers to II, and continue to knit.

* After knitting 6 ~ 7 rows with main yarn, pull out the Ravel Cord to remove waste knitting.
This methd produces a closed edge cast-on.

Picot Hem

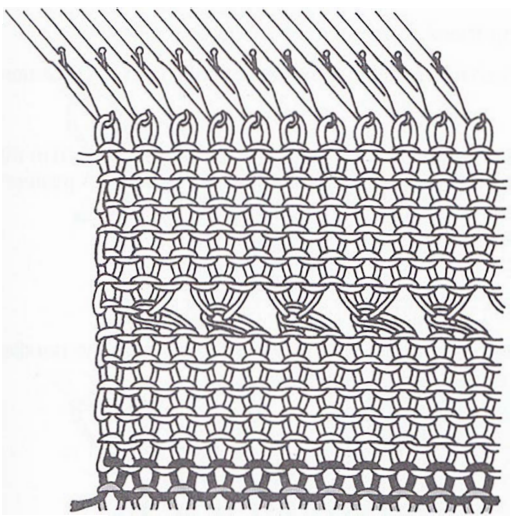




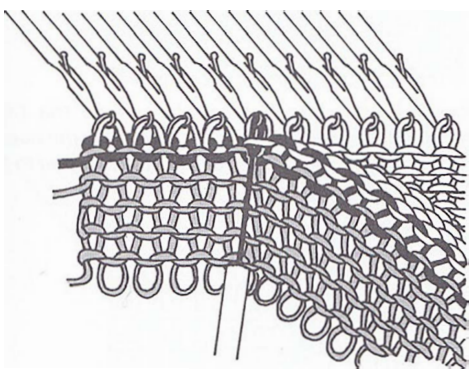
1. Arrange an odd number of needles in B position. Cast-on and knit several rows with waste yarn. Knit 1 row with the Ravel Cord "A".

   Set the Stitch Dial 1 number lower than for Stockinet and knit with main yarn, 1 row less than required for the depth of the hem.

2. Make picot eyelets by transferring every alternate stitch to its adjacent needle. Leave the empty needles in B position.

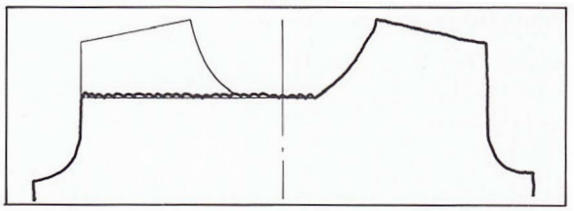


3. Reset the Stitch Dial to the original Stockinet setting, and knit the same number of rows required for the depth of the hem.



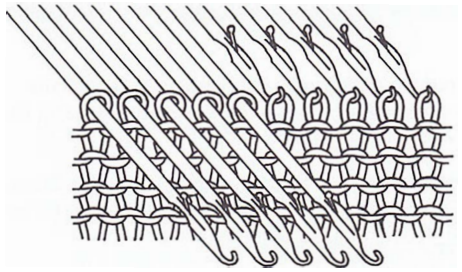
4. Place the sinker loops of the first row of the main knitting onto their corresponding needles. Remember to pick up the edge sinker loop.

5. Set the Stitch Dial 2 numbers higher than the number originally used and knit 1 row. Pull out the Ravel Cord to remove waste knitting. Reset the Stitch Dial to the Stockinet setting and continue to knit.



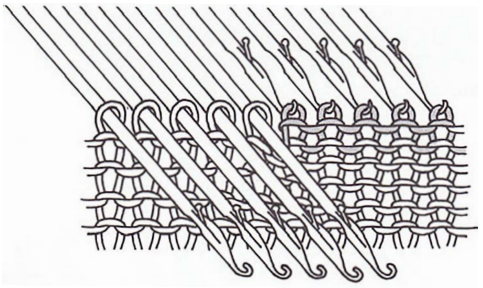
Holding Stitches

If it is necessary to shape a garment in sections, use one of the following methods.



In D position (Main Carriage only)

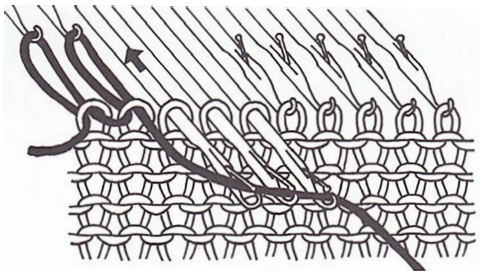
1. Push the needles for the section to be held to D position.



2. Set the Russel Levers to I, and continue to knit.

To continue knitting the stitches which have been held, push the needles back to C position, and continue to knit. (Stockinet only)

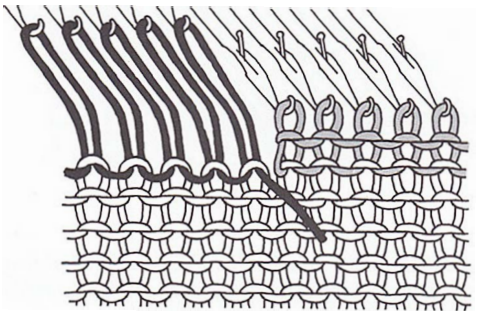
When pattern knitting, return the needles in holding position to B position using a Transfer Tool, replacing the stitches in the needle hooks.



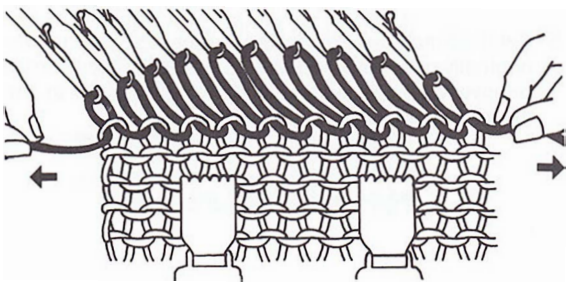
Using Ravel Cord

1. Push the needles for the section to be held, to D position.

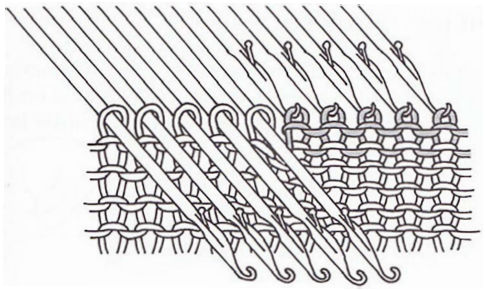
2. Starting with the end needle, lay the Ravel Cord in the needle hooks and push the needles back to A position.



3. Continue to knit.
   Before starting each row, make sure that the needles are well back in A position.



To continue knitting the held stitches, hang the Claw Weights on the fabric and replace the stitches in the needle hooks by pulling the Ravel Cord at the opposite end to the Carriage.

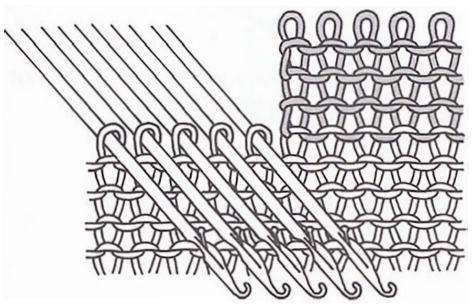


With waste yarn I (Main Carriage only)

Set the Cam Lever to **O** and the Russel Levers to I.

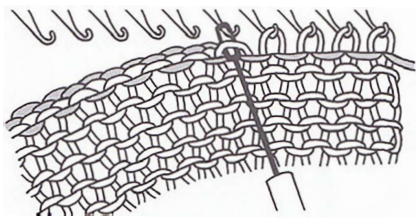
1. Leave the needles for the stitches to be released on waste yarn in B position. Push the remaining needles to D position.

2. Thread waste yarn into the Yarn Feeder and knit several rows.
   Remove this section from the machine.

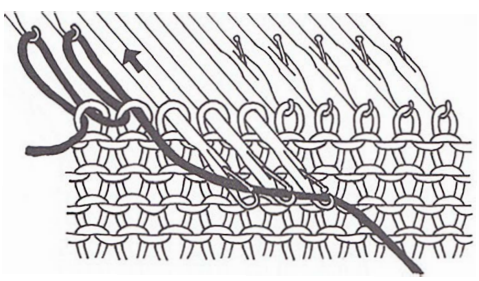


3. Push the needles from D position back to C position for Stockinet, or return to B position for pattern knitting. (See page 52)

   Reset the Carriage to the original settings and continue to knit.



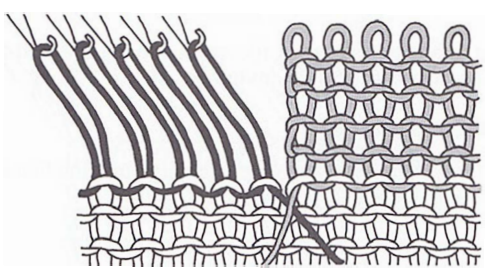
To continue knitting the stitches held on waste yarn, pick up the stitches on the last row of the main knitting and replace them on the empty needles.



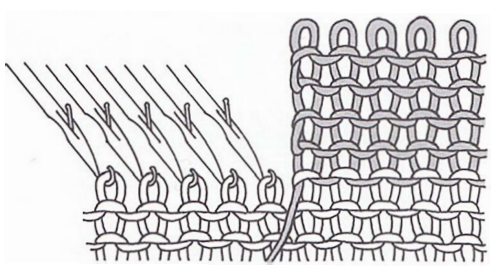
With waste yarn II (for Lace Carriage)

1. Push the needles to be held to D position.

2. Starting with the end needle, lay the Ravel Cord in the needle hooks and push the needles back to A position.

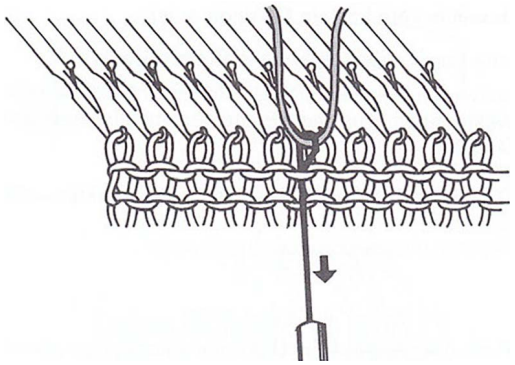


3. Set the Side Levers to ●, stop the Punch Card, and knit several rows with waste yarn over the needles in B position. Remove this section from the machine.



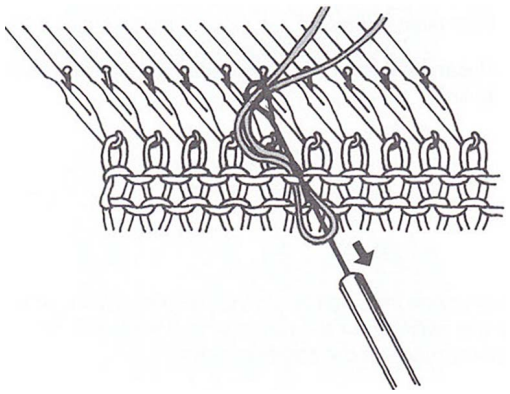
To continue knitting the held stitches, reset the Side Levers and Stop Knob at the original position, and unravel the Ravel Cord to replace the stitches in the needle hooks. *(See page 61)*

To continue knitting the stitches held on waste yarn, pick up the stitches on the last row of the main knitting and replace them on the empty needles.

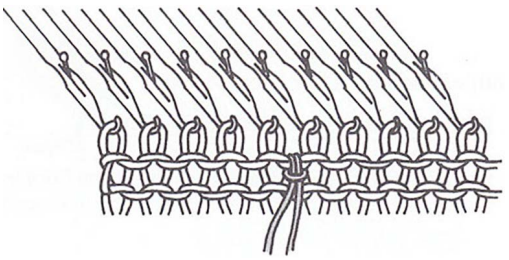


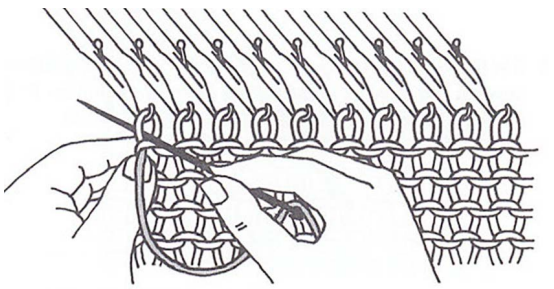
To Put the Yarn Mark

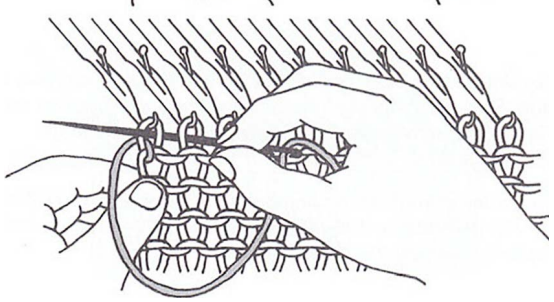
1. Insert the Tappet Tool into the sinker loop to be marked. Take a length of waste yarn, and make a loop on the Tappet Tool. Pull the Tappet Tool through the sinker loop.



2. Catch both ends of the waste yarn and pull out the Tappet Tool through the loop.







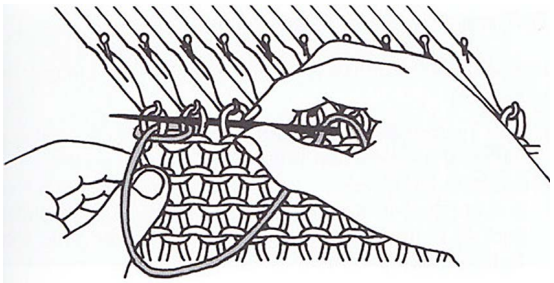
To Cast Off Using Back Stitch Method

Knit last row and break the yarn, leaving the end three times the width of the knitting.

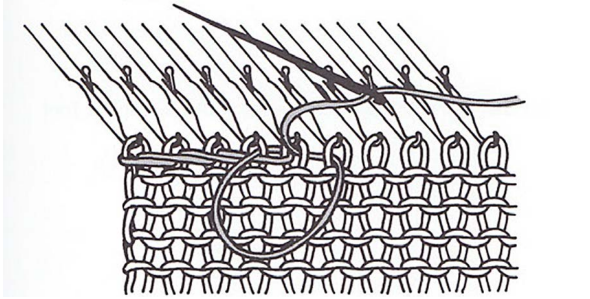
A. From the left end:

1. Thread the Tapestry Needle. Insert it into the first stitch and pull the yarn through.

2. Insert the Tapestry Needle in through the second stitch and out through the first stitch.

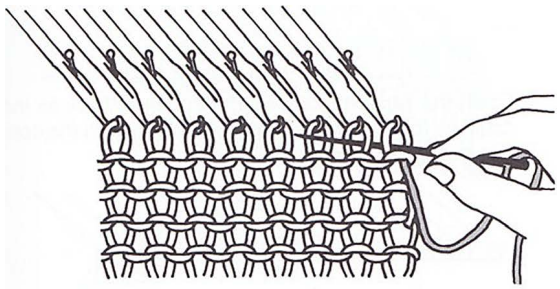


3. Insert the Tapestry Needle in through the third stitch and out through the second stitch.

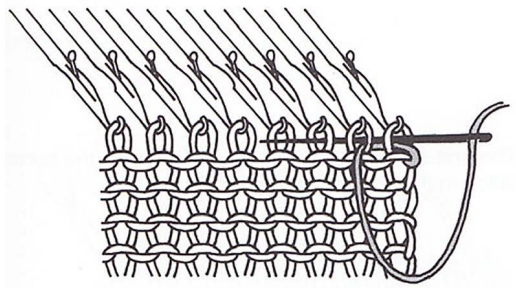


4. Repeat steps 2 ~ 3.
   Close the last stitch by oversewing once.

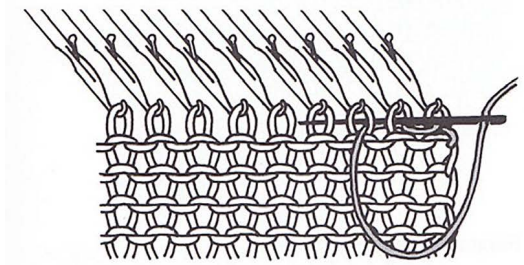
B. From the right end:



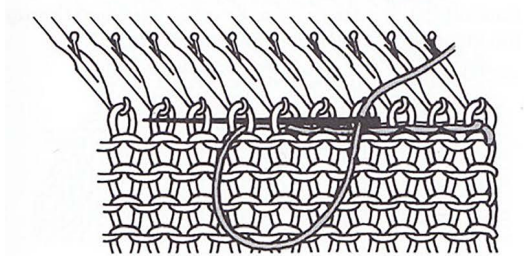
1. Insert the Tapestry Needle in through the first stitch and out through the second stitch.



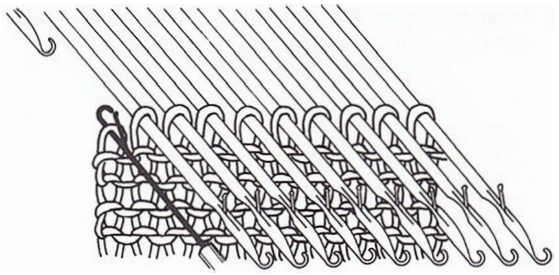
2. Insert the Tapestry Needle in though the first stitch and out through the third stitch, omitting the second stitch.



3. Insert the Tapestry Needle in through the second stitch and out through the fourth stitch, omitting the third stitch.



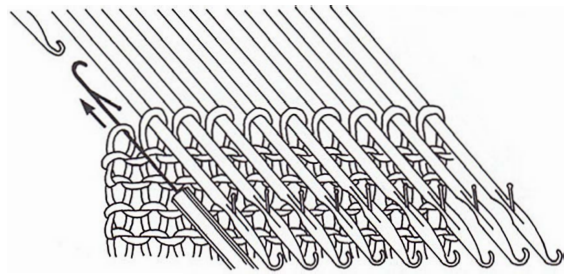
4. Repeat in the same way for the remaining stitches.



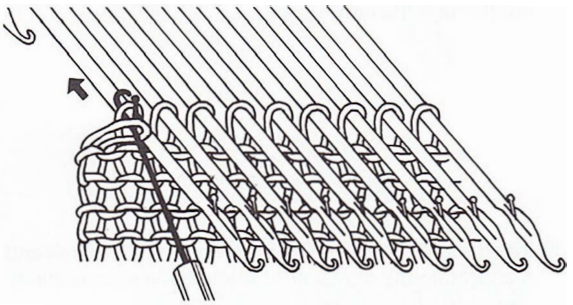
To Cast Off With Tappet Tool

This is used to make a closed edge when knitting is completed.

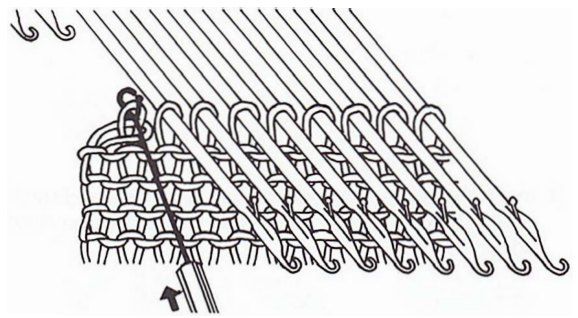
1. Knit the cast-off row with the Stitch Dial 3 ~ 4 numbers higher than the main tension. Push the needles to D position. On the side opposite the Carriage, catch the first stitch with the Tappet Tool and push the needle back to A position. The stitch is transferred onto the Tappet Tool.



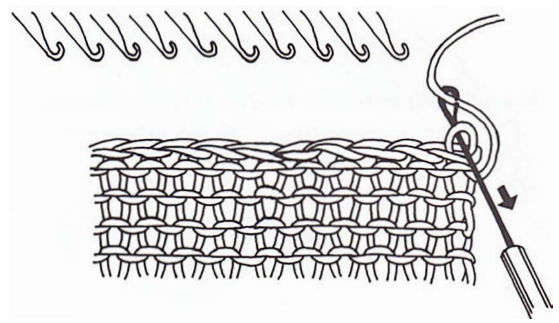
2. Push the stitch behind the latch of the Tappet Tool.



3. Catch the second stitch. Push the needle back as indicated by the arrow but pull the Tappet Tool in the opposite direction.



The first stitch will slip off the tool, leaving the second stitch in the hook of the Tappet Tool.

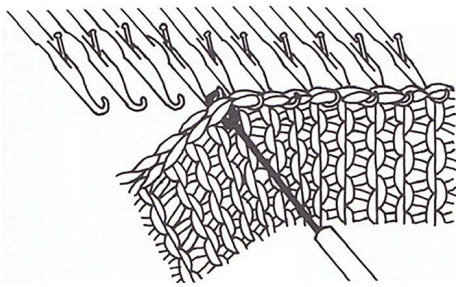


4. Repeat steps 2 ~ 3.

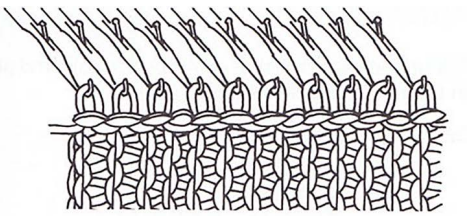
   Cast off the last stitch by pulling the yarn end through the stitch with the Tappet Tool as shown.

Trimming

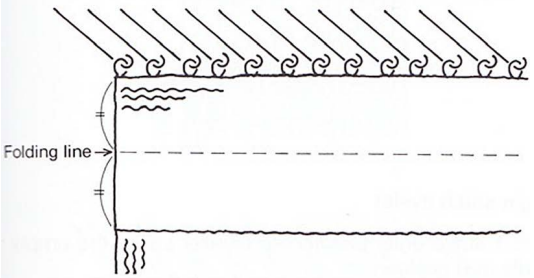
Used to trim neckbands, borders, etc.



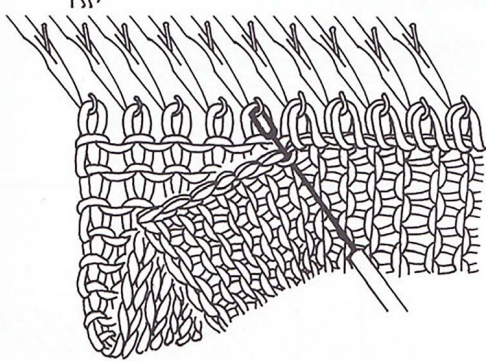
1. With the wrong side of the knitting facing you, pick up the edge stitches, and place onto the needles, omitting a stitch at appropriate intervals.



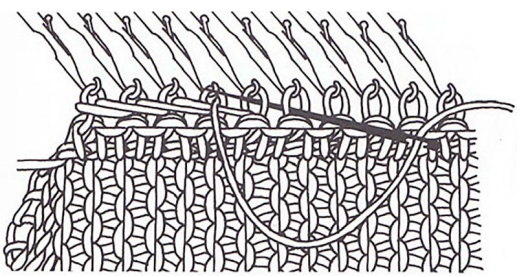
2. With main yarn, knit 1 row in Stockinet with the Stitch Dial 1 number lower than for Stockinet.



3. Reset the Stitch Dial to the original Stockinet setting and knit twice the depth of the hem required.

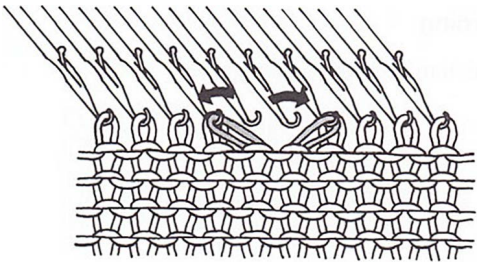


4. Pick up the sinker loops on the first row and place them onto the corresponding needles.



5. With the Stitch Dial 2 numbers higher than Stockinet setting, knit 1 row.

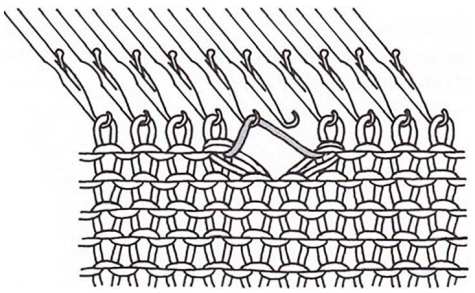
6. Cast off using the back stitch method. (See pages 63 ~ 64)



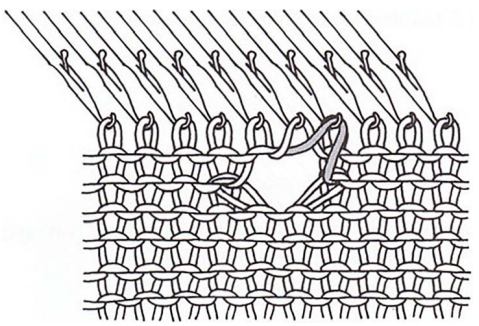
To Make a Buttonhole by Transferring Stitches

Double stitch eyelet

1. Transfer 2 stitches onto their adjacent needles as shown.
   Leave the empty needles in B position. Knit 1 row.

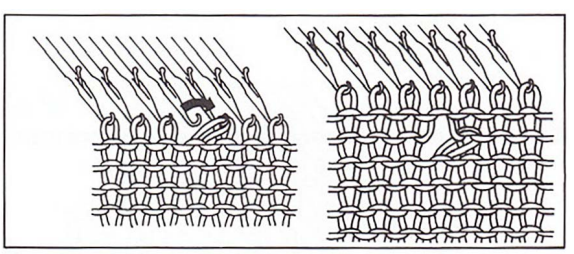


2. Remove the new loop of yarn from the right-hand needle. Knit 1 row.



3. Pick up the yarn crossing above buttonhole and place it on the needle as shown.

   Continue to knit up to the next buttonhole.

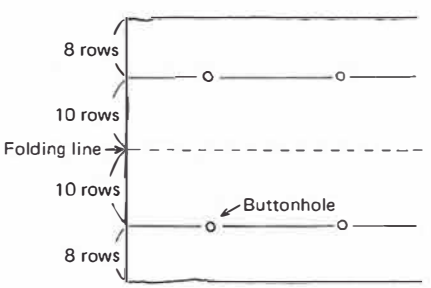


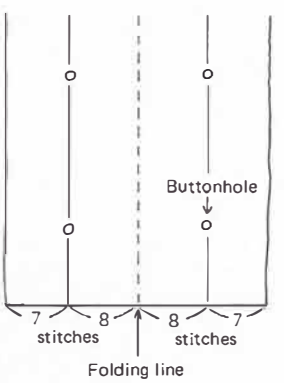
Single stitch eyelet

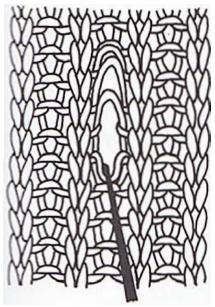
Place 1 stitch onto its adjacent needle. Leave the empty needle in B position.

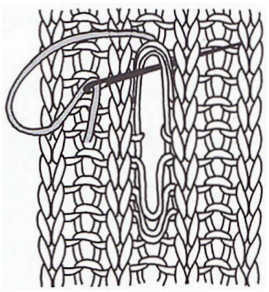
Continue to knit.

When making buttonholes on a double border, adjust the number of rows or stitches between the inside buttonholes and outside buttonholes so that they match when the border is folded.



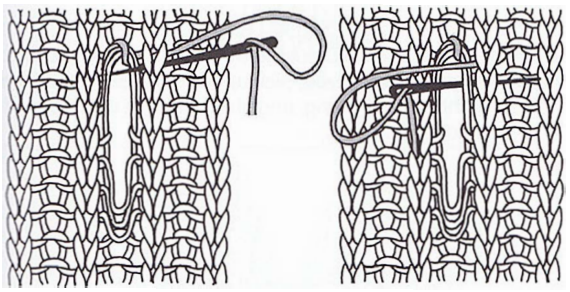




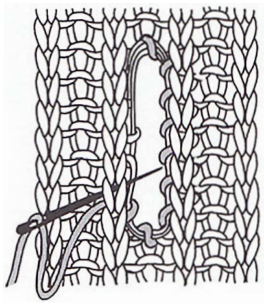


To Make a Buttonhole by Hand Work

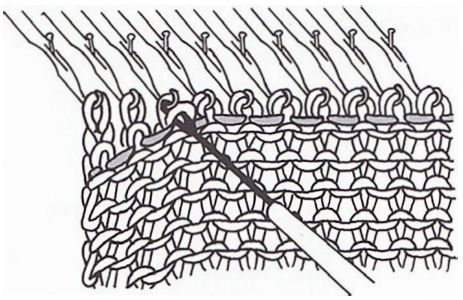
1. With the right side of the fabric facing you, pick up the loop of a purl stitch using a Crochet Hook at the buttonhole point, and pull the yarn.
   Insert a pencil or your fingertip into the fabric to make the hole big enough to take the button.



2. Thread main yarn into a Tapestry Needle. Wrap the yarn around the top edge of the buttonhole, then guide the yarn under the pulled yarns into the knit stitch from the rear side.



3. Oversew all round the buttonhole.



Seaming on the Machine

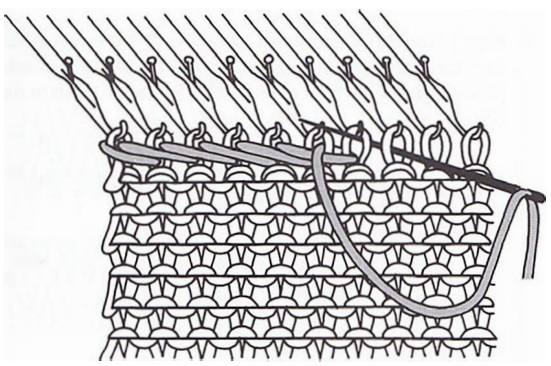
Stitch to stitch

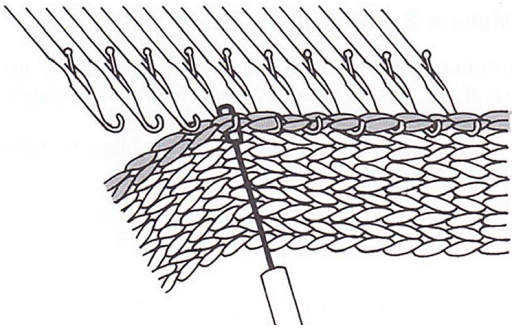
This is used for joining shoulders, joining a welt to the waist edge, or joining a neckband to the neck edge.

1. With the plain side of the first piece facing you, pick up the stitches on the last row of the main knitting and place them onto the needles. Unravel the waste knitting.

2. With the purl side of the second piece facing you, pick up the stitches on the last row of the main knitting and place them onto the needles. Unravel the waste knitting.

3. Knit 1 row 3～4 numbers looser than the main tension and cast off the stitches using the back stitch method (see pages 63 ～ 64), or with the Tappet Tool (see page 65).

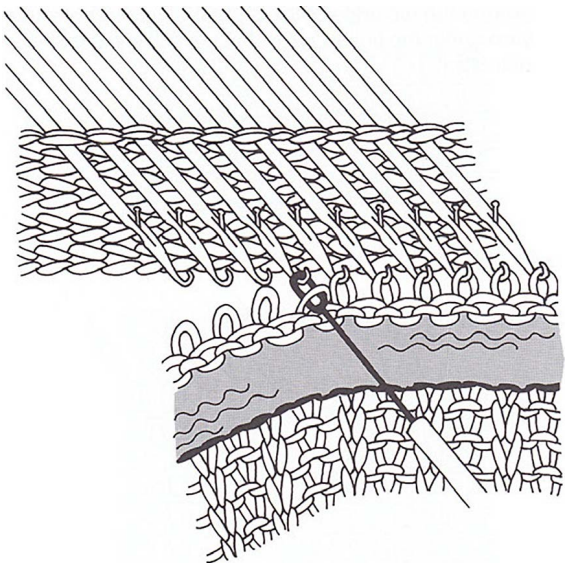




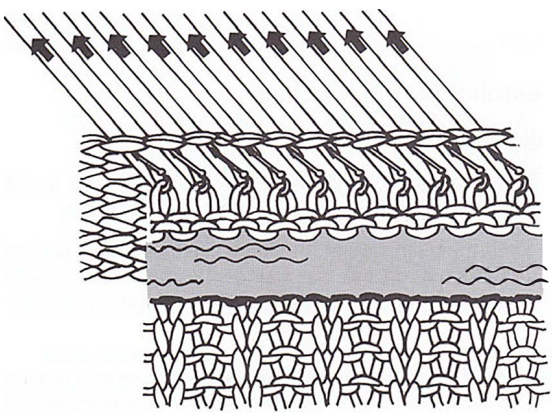
Open stitches to side edge

This is used for joining border to the front edge of a cardigan, neckband to the neck edge, etc.

1. With the plain side of the first piece facing you, pick up the edge stitches, omitting a stitch at appropriate intervals, and place them onto the needles.

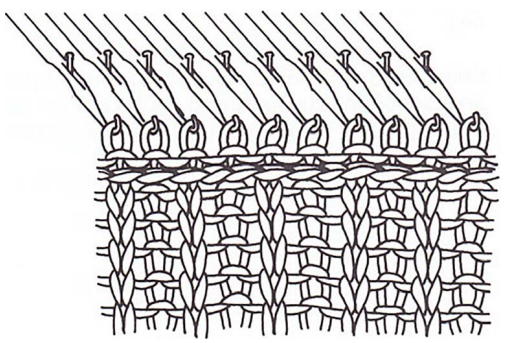


2. Push the needles to D position. With the purl side of the second piece facing you, pick up the stitches on the last row of the main knitting, and place them in the hooks of the needles.

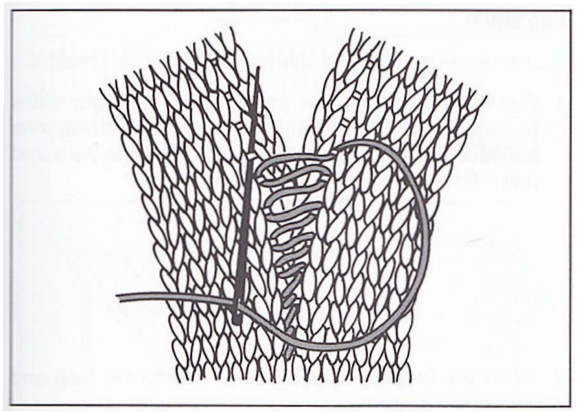


3. Push back the needles to B position.

   The stitches behind the latches will slip off the needles. Unravel the waste knitting.



4. Knit 1 row 3 ~ 4 numbers looser than the main tension and cast off the stitches using the back stitch method (see pages 63 ~ 64), or with the Tappet Tool (see page 65).



Joining by Hand

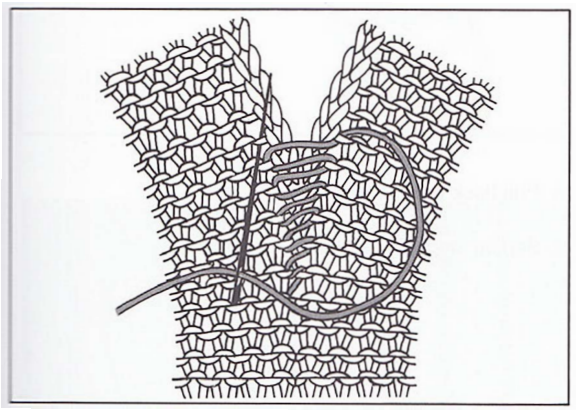
Blind stitch

This is used for joining side or underarm seams.
Use a 4-ply yarn.

Plain side as right side:

With the plain sides facing you, pick up each sinker loop between the last 2 edge stitches.

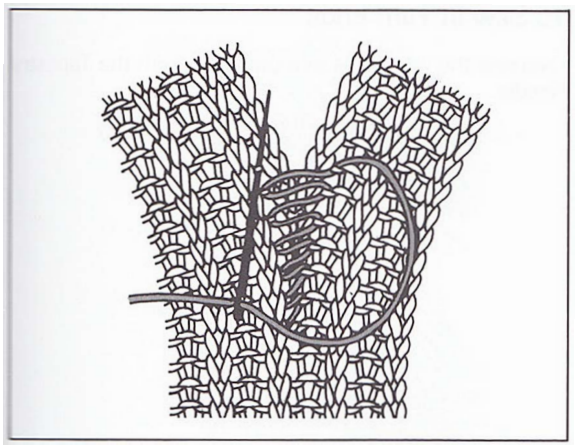
Repeat, picking up the sinker loop from every row.



Purl side as right side:

With the purl sides facing you, pick up each sinker loop between the last 2 edge stitches.

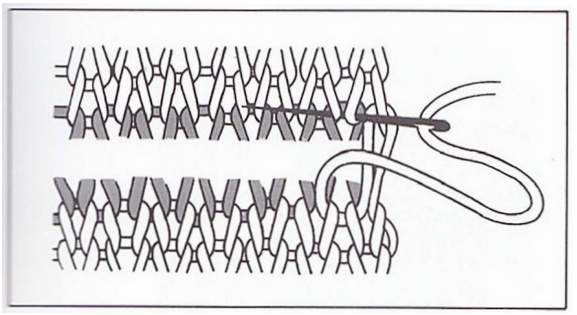
Repeat, picking up the sinker loop from every row.



K1. P1. Rib:

With the side to be used as the right side facing you, pick up the sinker loops between the last 2 edge stitches.

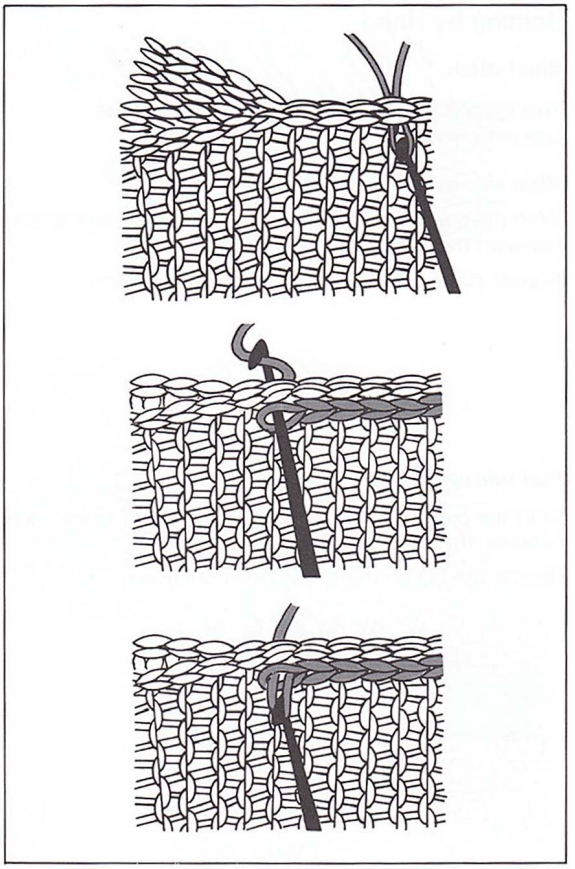
Repeat on every row.



Grafting

This is used to join two open rows, where the seam should be soft to the touch.

Align both pieces as shown and thread the knitting yarn through the stitches with the Tapestry Needle.



Slip stitch

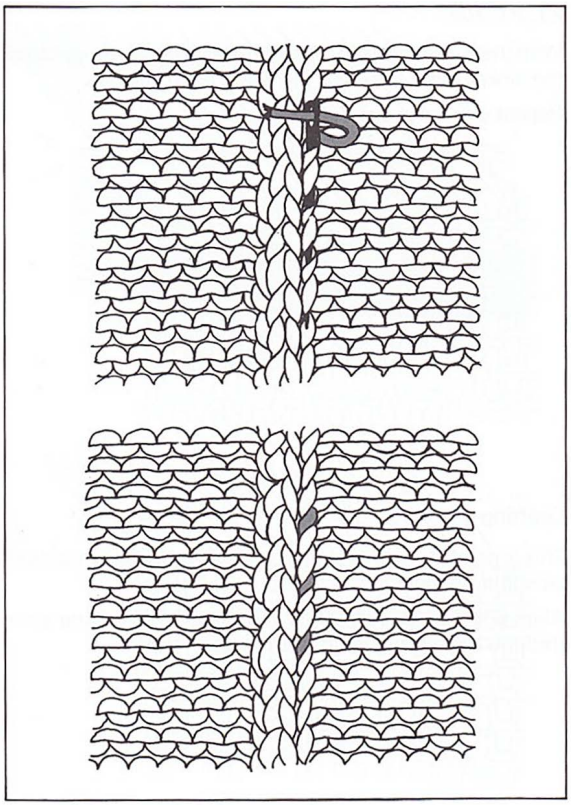
This is used for setting in sleeves or joining side seams.

1. Place the pieces to be joined with the right sides together. Insert the Crochet Hook into each sinker loop between the last 2 edge stitches. Catch the yarn and pull it through.

2. Insert the Crochet Hook into the next sinker loop and catch the yarn.

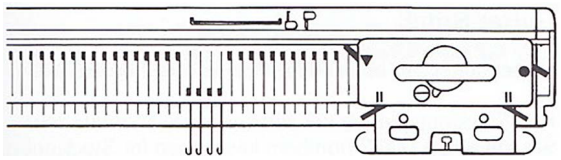
3. Pull back the Crochet Hook.

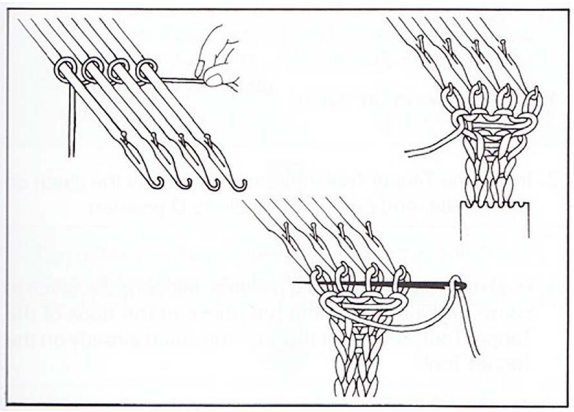
4. Repeat steps 2 ~ 3.



To Sew In Yarn Ends

Oversew the yarn ends into the seam with the Tapestry Needle.





Cord Knitting

1. Place the Carriage at the right side of the Needle Bed and set the controls as follows:

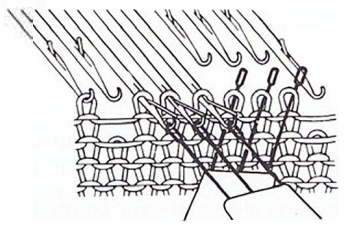
   Cam Lever..... **S**
   Stitch Dial..... lower than for Stockinet
   Side Levers..... ▼ (left) ● (right)
   Russel Levers..... **II**
   Weaving Knobs..... O
   Stop Knob..... ●

2. Depending on the thickness of the cord, bring 3 ~ 5 needles to D position. Cast-on using the winding method as illustrated.
3. Move the Carriage twice and push the working needles to D position. (Repeat this until the Claw Weight can be put on the cord.)
4. After knitting several rows, hang Claw Weight.
5. Continue knitting until the desired length has been knitted.
6. Cut the yarn, leaving 10cms. Cast off with a Tapestry Needle.

Cable Pattern

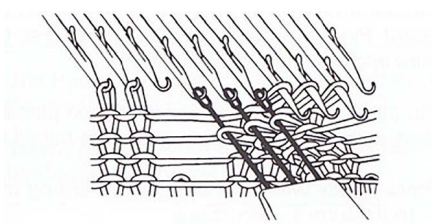
Cable patterns are formed by crossing a group of stitches over another group of stitches using two Transfer Tools.

For 6-stitch cable, use an appropriate yarn which can take the strain of being transferred across a group of the needles.



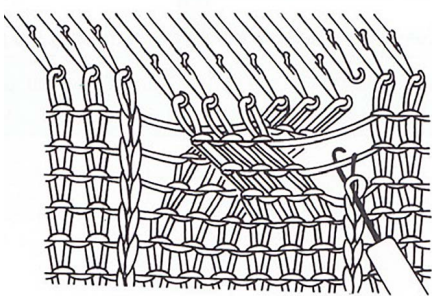
Try a six stitch cable.

1. Drop one stitch at either side of the 6 stitches to be cabled.
   Using two 3-prong Transfer Tools, remove the 6 stitches from their needles. Hold those stitches on the Transfer Tools with their prongs kept upward.

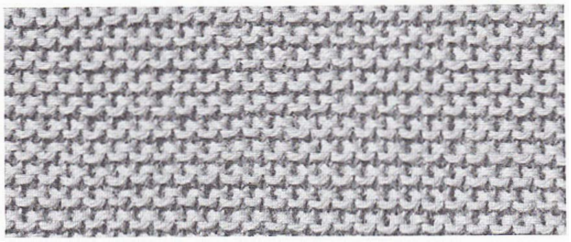


2. Cross the Transfer Tools over once.

   Place the left-hand 3 stitches to the right-hand needles. Place the remaining stitches onto the left-hand needles.



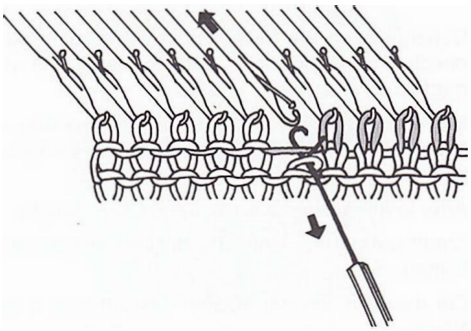
3. Unravel the dropped stitches right down to the first row. Reform the stitches and replace on their needles.
4. Push the 6 cabled needles to C position and knit to the next cable point.
5. Repeat steps 1 ~ 4.



Garter Stitch

Garter stitch can be used for laps, collars, borders, etc.

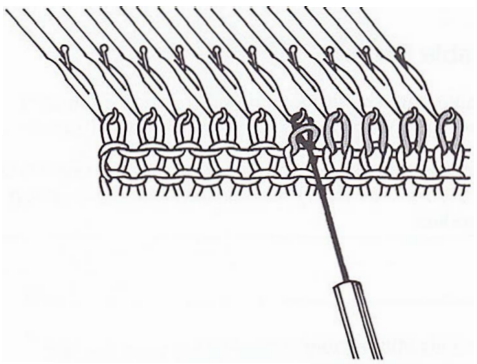
Knit Stockinet, purling the stitches every alternate row. Set the Stitch Dial 2 numbers lower than for Stockinet.



1. Knit 2 rows in Stockinet.

2. Insert the Tappet Tool into the stitch below the stitch on the needle, and push the needle to D position.

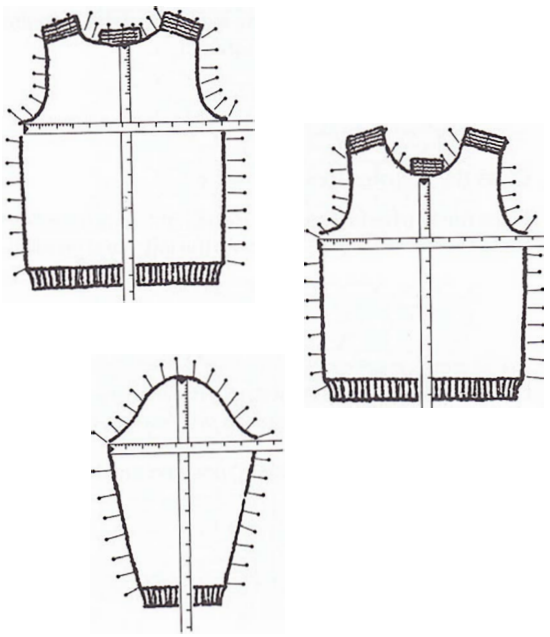
3. Push the needle back to B position, allowing the stitch to come undone. Catch the bar above in the hook of the Tappet Tool, and pull it through the stitch already on the Tappet Tool.



4. Place the new stitch back on the needle.

   Repeat steps 2 ~ 4 all along the row.

5. Knit 2 rows in Stockinet and reform the stitches on the second row following steps 2 ~ 4.



Blocking and Pressing

After knitting the pieces of your garment, you must lay them flat and pin them out to their correct shape and size.

1. Pin out a piece with the wrong side up on an ironing board. Pin the widest part of the piece first, then measure and pin to the correct length.

2. Pin all around the edges, spacing the pins about 2 ~ 3cm. apart. (Place the pins inside the ribbed edge.)

3. Press lightly with a steam iron according to the yarn manufacturer's instructions.

4. Leave the pieces to dry before removing the pins.

IF MISTAKES OCCUR DURING KNITTING

Stockinet

Unravel the incorrectly knitted rows and align the needles in B position. Using Release Lever, move the Carriage to the yarn side.
(See page 36)

↓

Turn back the Row Counter by the same number of rows as you have unravelled.

↓

Continue knitting.

Vertical Expansion

Unravel an even number of knitted rows and align the needles in B position.
(See page 36)

↓

Turn back the Row Counter by the same number of rows as you have unravelled. Disengage the Row Counter Tripper.

↓

Return the Punch Card by half the number of rows unravelled and set Stop Knob to ●.

Memorize the pattern referring to pages 37～38 and move the Carriage to the yarn side.

↓

Release the Card and Row Counter and continue knitting.

Pattern Knitting

Unravel the incorrectly knitted rows and align the needles in B position. (See page 36)

In lace knitting, if there are empty needles on the row to be unravelled, replace the stitches on their original needles before unravelling.

↓

Turn back the Row Counter by the same number of rows as you have unravelled.

↓

Turn back the Punch Card by the same number of rows as you have unravelled and set Stop Knob to ●.

In fashion lace knitting, the Pattern Row Numbers in the box should NOT be counted as unravelling rows.

Memorize the pattern referring to pages 37～38 and move the Carriage to the yarn side.

↓

Release the Card and Row Counter and continue knitting.

GARMENT KNITTING WITHOUT THE KNIT CONTOUR

The instructions below explain how to knit a lady's pullover. This is an example based on the size, and the tension gauge shown below.

Measurements of Finished Garment:

Bust ..... **94cm.**
Length ..... **59cm.**
Back Width ..... **36cm.**
Sleeve Length ..... **56cm.**

Material Needed:

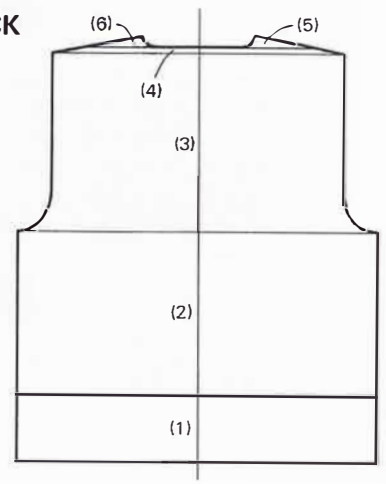
4-ply (medium) yarn ..... **400gs.**

Tension Gauge:

32 stitches by 44 rows to 10cm. sq. measured over Stockinet with Stitch Dial at ⑥.

(This sample only shows how to work from the diagram patterns. If you want to knit a garment in your desired size, you must calculate your own pattern, according to your own gauge.)

BACK



NOTE:

" ⭘ " shows the reference page(s).

(1) Knit welt.

— Arrange 150 needles and knit welt by K1.P1. Rib or Mock Rib.

(⭘ K1.P1. Rib — pages 56 ~ 57: On step 3, knit 4 rows starting from the right side, and on step 6, knit 24 rows.)

***If you have a Ribber...**

Swing Indicator..... 5
Half Pitch Lever..... P
Stitch Dial.....⓪

Cast on with main yarn in K1.P1. Rib.

Stitch Dial at ③ ~ ④. Knit 24 rows, finishing with the Carriage at the right.

Transfer all the ribber stitches onto the corresponding knitter needles using Double Eye Transfer Tool. (150 stitches on the knitter)

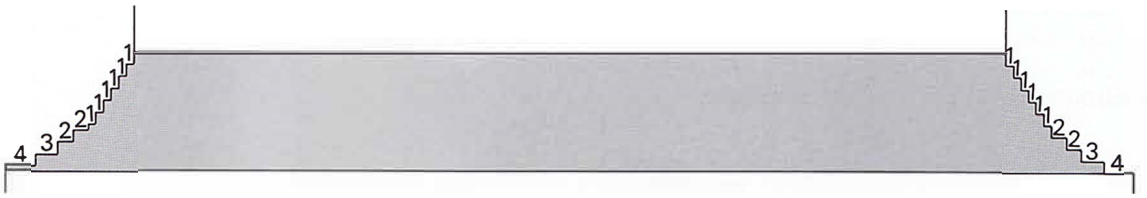
Drop the Ribber to the lowest position and exchange the Ribber Arm for the Knitter Arm.

(⭘ Mock Rib — page 58: On step 3, knit 48 rows.)

(2) Knit up to armholes.

— Row Counter 000. Stitch Dial at ⑥. Knit 140 rows without shaping. Carriage at right.

(3) Shape armholes.



— Decrease 4 stitches at the beginning of the next 2 rows, 3 stitches at the beginning of the next 2 rows, and 2 stitches at the beginning the next 4 rows.
(◯ Decreasing Multiple Stitches — page 48)

— Decrease 1 stitch at both ends of the next and every following alternate row, 6 times in all till Row Counter shows 159.
(◯ Decreasing 1 Stitch — page 48)

— Knit 62 rows without shaping.
Row Counter shows 221. Carriage at left.

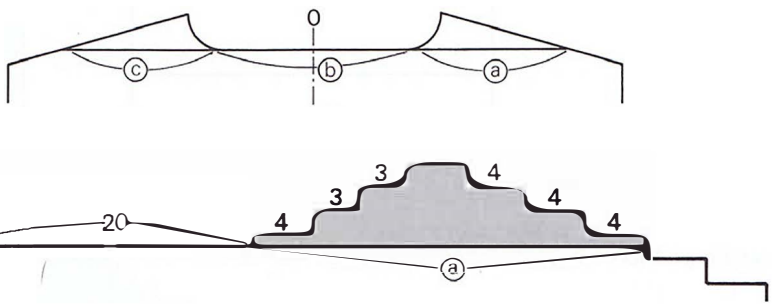
(4) Shape shoulders by partial knitting.

— Set the Russel Levers to I.
— Decrease 4 stitches by partial knitting at the edge of the next 5 rows. Row Counter shows 226.
(◯ Partial Knitting; Decreasing Stitches — page 52)

(5) Shape neck edge and right shoulder.

At the neck edge, divide the knitting into three sections, right ⓐ, centre straight ⓑ and left ⓒ. Work each section separately to shape the neck edge and shoulder at the same time, as instructed below.

*Hold 70 stitches on sections ⓑ and ⓒ.
(◯ Holding Stitches; Using Ravel Cord — page 61)



— Knit 1 row. Decrease 4 stitches at neck edge of the next row and 4 stitches by partial knitting at the end of the row.
(◯ Decreasing Multiple Stitches — page 48)
(◯ Partial Knitting; Decreasing Stitches — page 52)

— Knit 1 row. Decrease 3 stitches at neck edge of the next row and 4 stitches by partial knitting at the end of the row. Repeat this step once more.

— Knit 1 row. Row Counter shows 233.

— Break the yarn, leaving the end 10cm. Unthread the yarn.

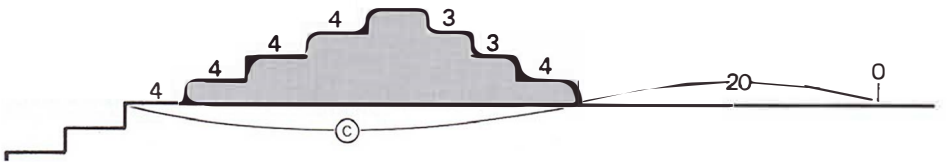
— Push the needles for the right shoulder back to C position.

— With waste yarn, knit several rows and remove this section from the machine.

— Push the empty needles back to A position.

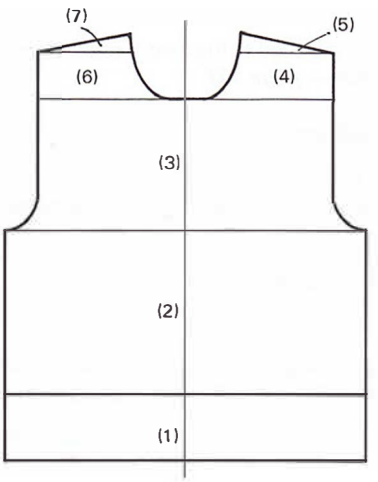
— Push 40 needles on section ⓑ to B position, replacing the stitches in the needle hooks.
— Put a yarn mark at the centre(0) on the fabric.
(✪ To Put the Yarn Mark — page 63)
— Remove this section on waste knitting. Push the empty needles back to A position.

(6) Shape neck edge and left shoulder.



— Carriage at right.
— Push 30 needles on section ⓒ to B position, replacing the stitches in the needle hooks.
— Reset the Row Counter to 226.
— Decrease 4 stitches by partial knitting at the end of the next row.
— Knit 1 row. Decrease 4 stitches at neck edge of the next row and 4 stitches by partial knitting at the end of the row.
— Knit 1 row. Decrease 3 stitches at neck edge of the next row and 4 stitches by partial knitting at the end of the row. Repeat this step once more.
— Knit 1 row.
— Break the yarn, leaving the end six times the width of the shoulder. Unthread the yarn.
— Reset the Russel Levers to **II**. Knit several rows with waste yarn and remove the fabric from the machine. ■

FRONT



(1) — (2) Knit up to armholes.

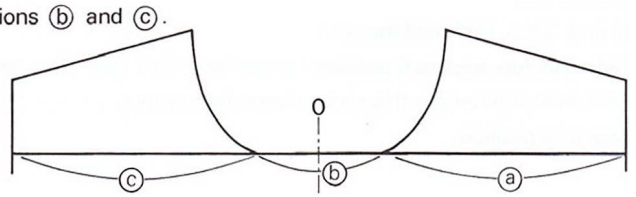
— Knit up to armholes in the same way as for the back.
Row Counter shows 140.

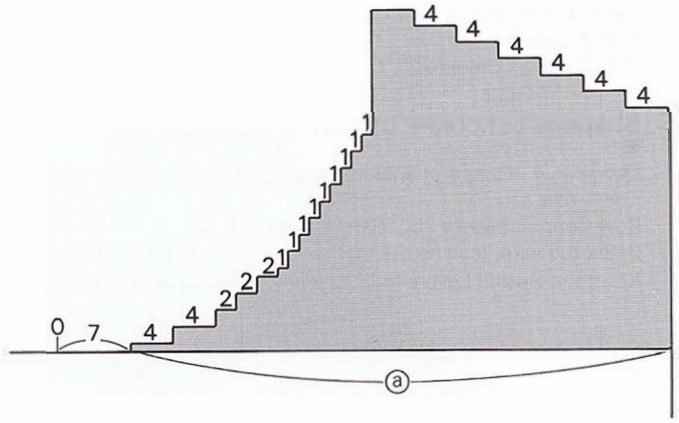
(3) Shape armholes.

— Shape armholes in the same way as for the back till Row Counter shows 159.
— Knit 33 rows without shaping.
Row Counter shows 192. Carriage at right.

(4) Shape front neck edge of right section.

* Hold 65 stitches on sections ⓑ and ⓒ.



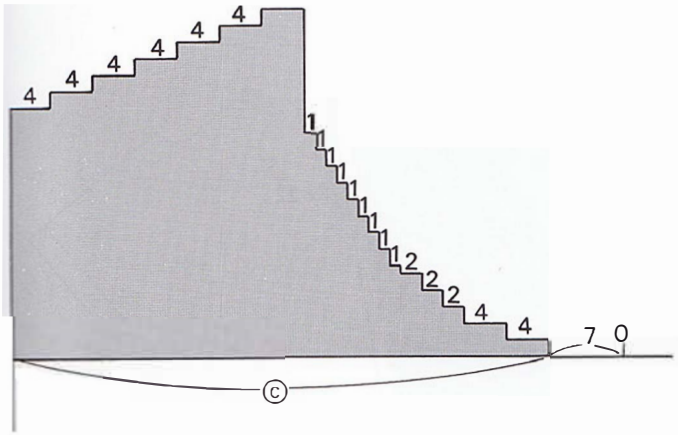


— Knit 1 row. Decrease 4 stitches at neck edge of the next row and following alternate row.
— Knit 1 row. Decrease 2 stitches at neck edge of the next and every following alternate row, 3 times in all.
— Decrease 1 stitch at neck edge of the next and every following alternate row, 9 times in all.
— Knit 2 rows.
Row Counter shows 221. Carriage at left.

(5) Shape right shoulder by partial knitting.

— Set the Russel Levers to **I**.
— Decrease 4 stitches by partial knitting at shoulder edge of the next and every following alternate row, 6 times in all.
— Knit 1 row.
Row Counter shows 233. Carriage at left.
— Break the yarn, leaving the end 10cm. Unthread the yarn.
— Push the needles for the right shoulder back to C position.
— Remove this section on waste knitting.
— Push the empty needles back to A position.
— Push 14 needles on section ⓑ to B position, replacing the stitches in the needle hooks.
— Put a yarn mark at the centre(0) on the fabric.
— Remove this section on waste knitting. Push the empty needles back to A position.

(6) Shape front neck edge of left section.



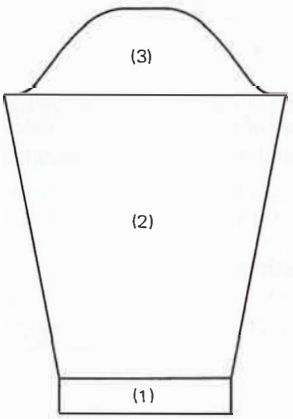
— Carriage at right.
— Push 51 needles on section ⓒ to B position, replacing the stitches in the needle hooks.
— Reset the Row Counter to 192.
— Knit 2 rows. Decrease 4 stitches at neck edge of the next row and following alternate row.
— Knit 1 row. Decrease 2 stitches at neck edge of the next and every following alternate row, 3 times in all.

— Decrease 1 stitch at neck edge of the next and every following alternate row, 9 times in all.
— Knit 2 rows.
Row Counter shows 222. Carriage at right.

(7) Shape left shoulder by partial knitting.

— Decrease 4 stitches at shoulder edge of the next and every following alternate row, 6 times in all.
— Knit 1 row.
Row Counter shows 234. Carriage at right.
— Break the yarn, leaving the end six times the width of the shoulder. Unthread the yarn.
— Reset the Russel Levers to **II**. Knit several rows with waste yarn and remove the fabric from the machine. ■

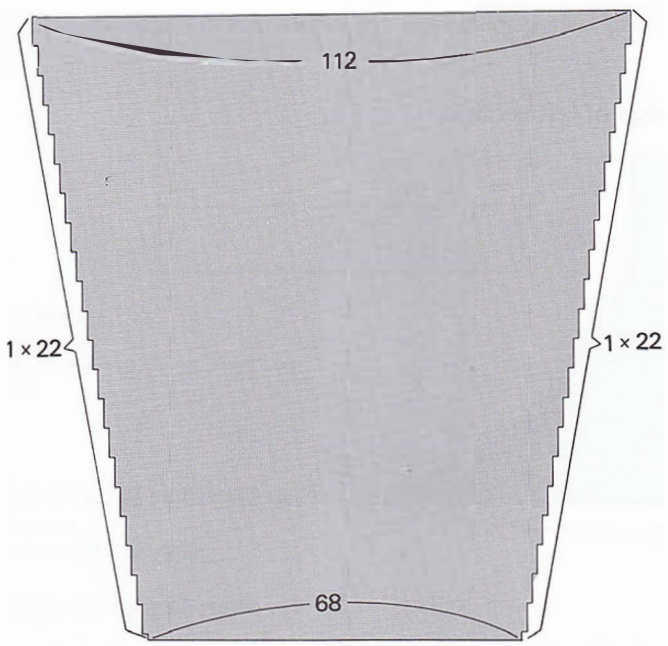
SLEEVES
(both alike)



(1) Knit cuff.

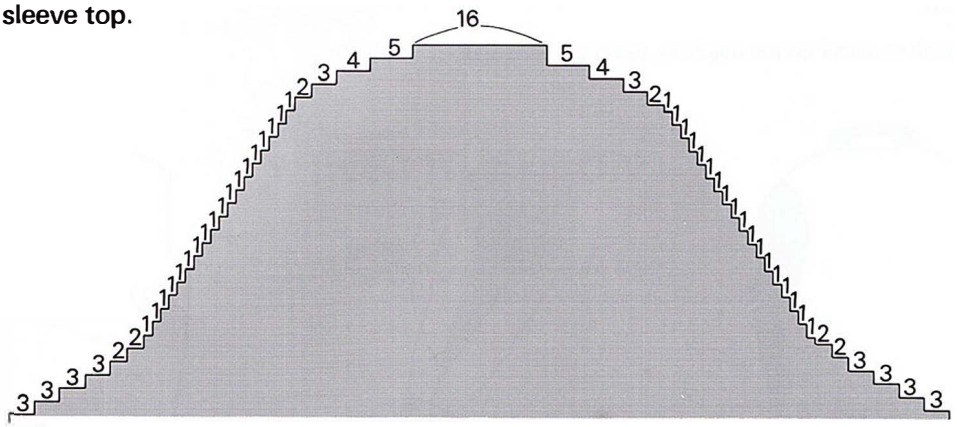
— Arrange 68 needles and knit in the same way as for the welt.

(2) Shape underarm.



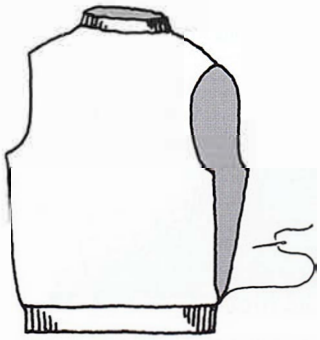
— Row Counter 000.
— Stitch Dial at ⑥. Increase 1 stitch at both ends of the next and every following 7th row, 22 times in all, until the Row Counter shows 148.
(○ Fully Fashioned Increase — page 51)
— Knit 7 rows without shaping. 112 stitches remain on the Knitter. Row Counter shows 155.

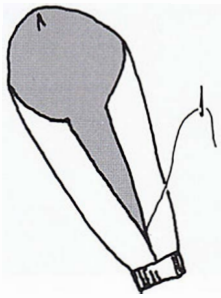
(3) Shape sleeve top.

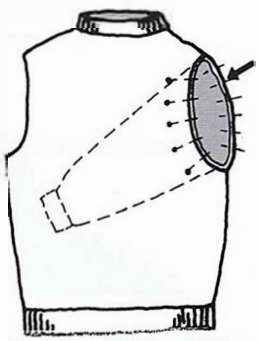

16
5
5
4
4
3
3
2
2
3
3
3
3
3
3
2
2
1
1
1

Making Up

*Join the left shoulder on the machine, using the yarn end.







— Join the side, neckband and underarm seams.
(*Joining by Hand; Blind stitch — page 70*)

— Turn the garment to the wrong side. Position the sleeves in the armholes, with the right sides together. Pin them as illustrated and work slip stitch all along the edges.
(*Joining by Hand; Slip stitch — page 71*)

— Sew in yarn ends on the wrong side.
(*To Sew In Yarn Ends — page 71*)

— Give final press. ■

INSTRUCTION FOR LACE CARRIAGE

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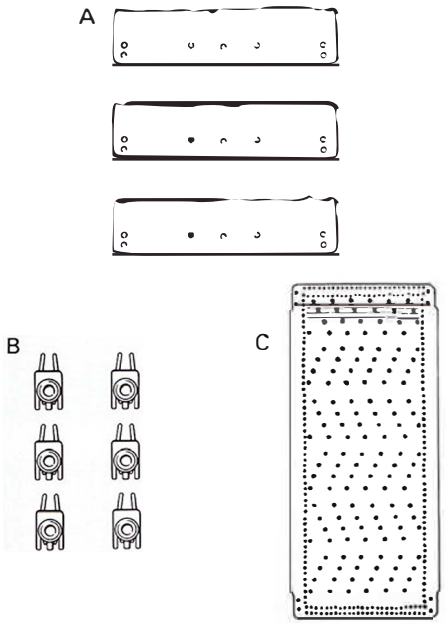
The Lace Carriage is an Optional Accessory

- It is recommended that you should practice with the Main Carriage to get acquainted with the machine knitting, before starting to knit lace patterns.
- For setting up the machine and yarn preparation before knitting, read the instructions on pages 1 ~ 10.

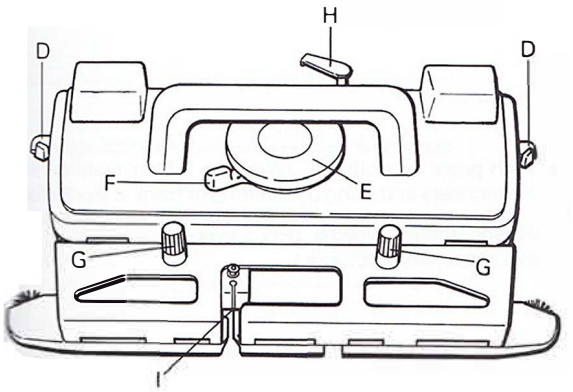
ACCESSORIES AND CARRIAGE



Accessories

Remove the accessories from the packing.

A — Wide Claw Weight (3)
B — Edge Pin (6)
C — Lace Punch Card (10)



Carriage

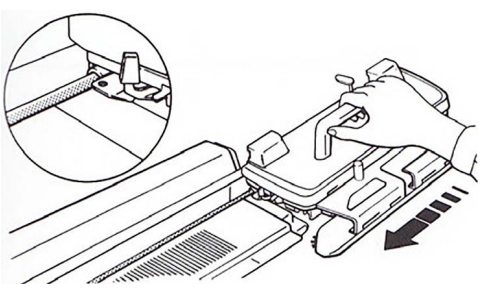
Lace Carriage is packed in styrofoam packing with the Arm attached.

Raise the Carriage Handle and remove the Lace Carriage out of the packing.

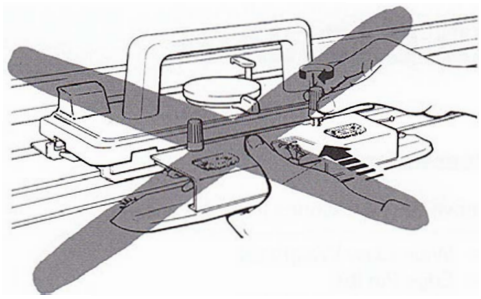
D — Side Levers
E — Stitch Dial
F — Cam Lever*
G — Arm Nuts
H — Row Counter Tripper
I — Yarn Feeder

*Any of the two different positions can be selected by moving the Cam Lever, according to stitch types.

Λ/O — PLAIN LACE, STOCKINET, CAST-ON
⩓/P — FASHION LACE (Passing Position)

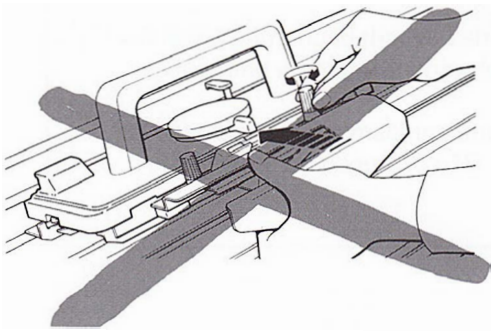


Place the Lace Carriage on the Needle Bed at the right side.



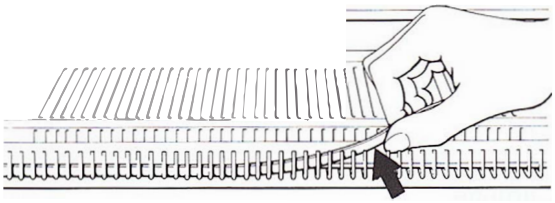
IMPORTANT!

① *Do not attach the Main Carriage Arm to the Lace Carriage, or the Lace Arm to the Main Carriage. This will result in damage to the Arm or the needles.*



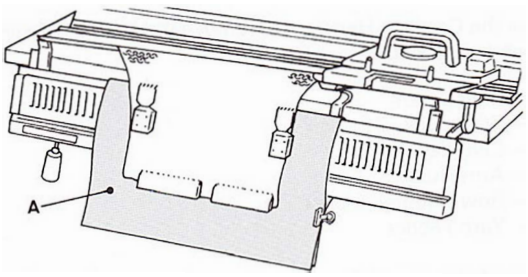
② *Do not connect the Ribber Arm to the Lace Carriage.*

The Ribber Arm can only be connected to the Main Carriage.



If you knit with the Ribber connected...

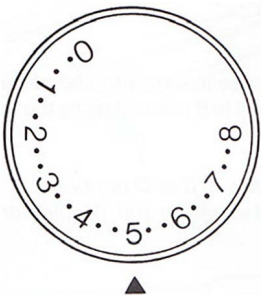
- Set the Ribber at the lowest position.
- Remove the Close Knit Bar from the Needle Bed, if it is in use.

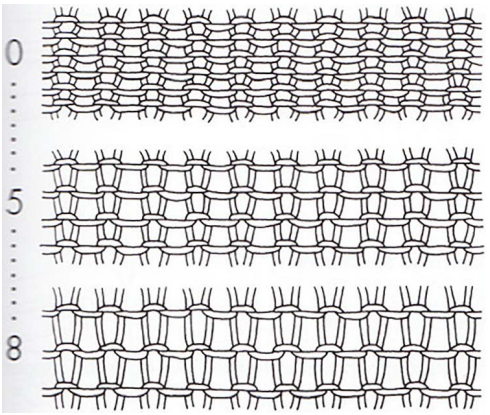


- With paper or cloth "A", cover the Ribber needles and sinker posts and bring the knitting in front of the Ribber.

  (Plastic Ribber Needle Bed Covers are available on request as an accessory.)

YARN AND STITCH DIAL

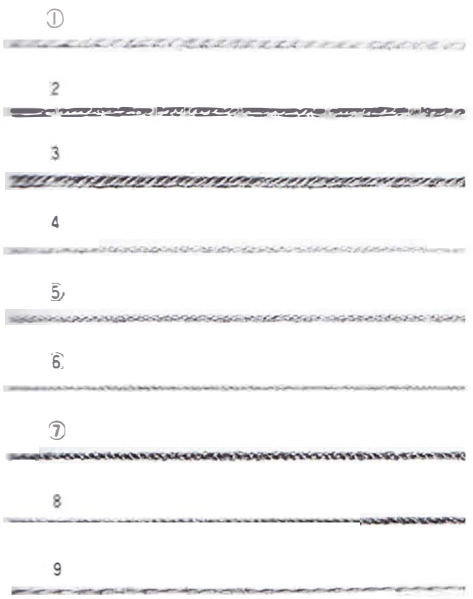




Stitch Dial

Use this to control the size of stitches.
Set the numbers to the ▲ mark at the front.

The higher the number on the Stitch Dial, the larger the stitch size (the fabric is loose).
The lower the number, the smaller the stitch (the fabric is tight).



Yarn and Stitch Dial

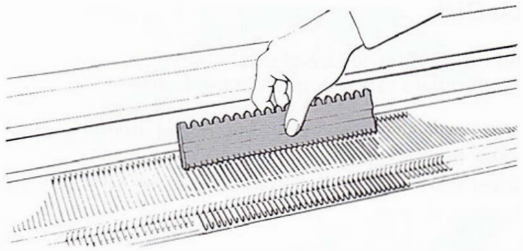
Type of Yarn	Stitch Dial (stockinet)	Stitch Dial (lace)
① Thin yarn (2-ply)	2 ~ 3	(3) ~ 4
② Light yarn (3-ply)	3 ~ 5	4 ~ 5
③ Medium yarn (4-ply)	4 ~ 6	5 ~ 6
④ Cotton thread (thin)	3 ~ 4	4 ~ 5
⑤ Cotton thread (regular)	4 ~ 5	5 ~ 6
⑥ Synthetic yarn (thin)	2 ~ 3	(3) ~ 4
⑦ Synthetic yarn (regular)	3 ~ 4	4 ~ 5
⑧ Synthetic yarn (regular)	3 ~ 4	4 ~ 5
⑨ Mohair (thin)	3 ~ 5	4 ~ 5

NOTE:

Do not adjust the Stitch Dial to the numbers in parentheses for Punch Card No. L-5, L-6 and L-7 which produce meshlike patterns.

Do not use heavy knop yarn or thick mohair yarn.

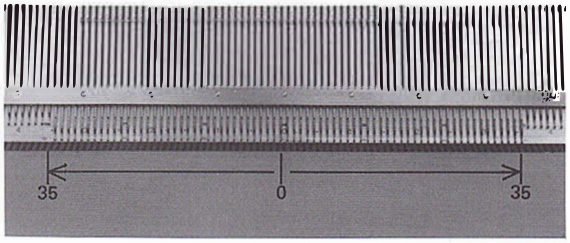
CAST-ON AND KNITTING

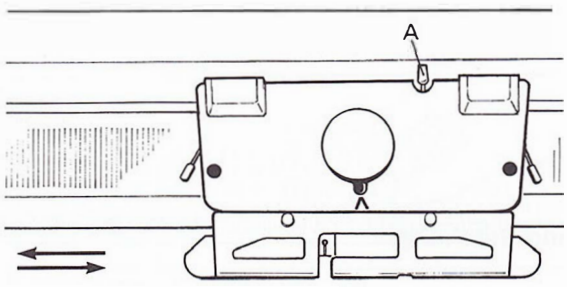


Cast-on

For practice, push 35 needles at both sides of centre(0), (70 needles in total), from A to B position using the straight side of the Needle Pusher.

Never push the needles to C or D position.
This will result in damage to the needles or the Lace Carriage.





Set the Carriage as follows:

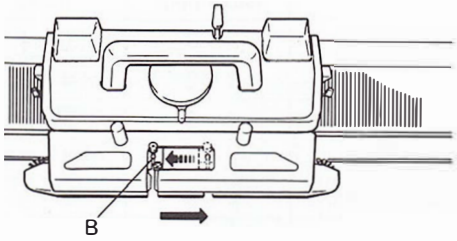
Cam Lever.....Λ
Side Levers..... ●

The Cam Lever is connected to the Row Counter Tripper "A".

When the Cam Lever is set at:

Λ — Plain Lace.....Row Counter is operated.
⩚ — Fashion Lace.....Row Counter is not operated.

Do not adjust the Row Counter Tripper by hand.

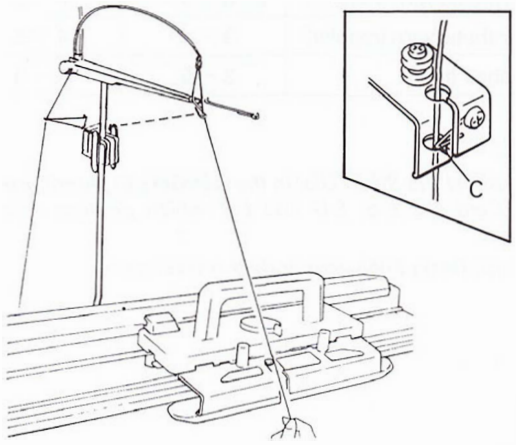


Set the Stitch Dial refering to the table on page 86.

Slowly move the Carriage across the Needle Bed until it has passed all the needles.

Place the Carriage at the right.

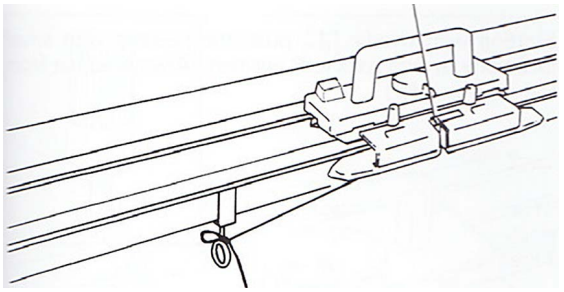
Move the Carriage to the right to move the Yarn Feeder "B" to the left side of the Arm.
To thread up the yarn, the Yarn Feeder must be at this position.



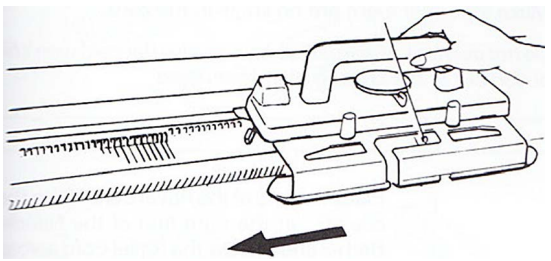
Remove the yarn end from the Yarn Clip and pull it down to the Carriage.

Hold the yarn with both hands and slide it into the Yarn Feeder.

The yarn must be behind the Guide Pin "C".

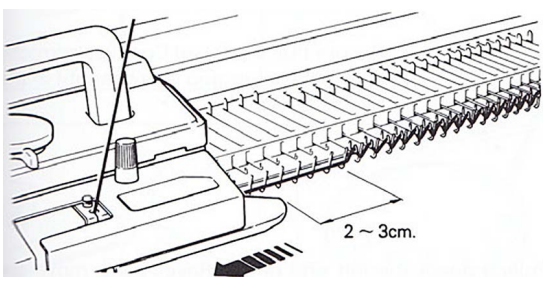


Fasten the yarn end to the Clamp nearest the Carriage.

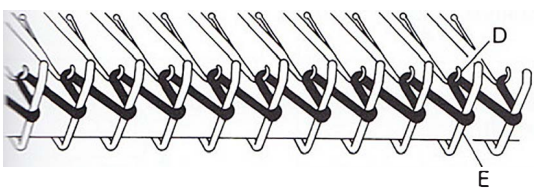


Eliminate slack yarn by pulling the yarn down at the back of the Yarn Rod.

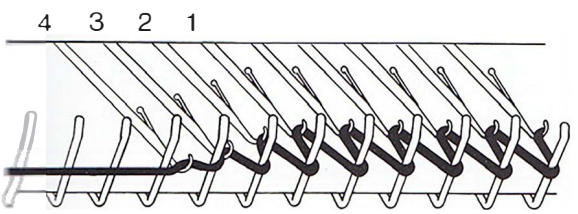
Slowly move the Carriage from right to left until it has passed all the needles in B position.



Be sure to take the Carriage past the last knitting needle by 2 ~ 3cm.

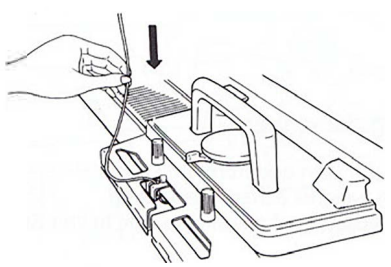


Even loops have been formed between the needle hooks "D" and sinker posts "E". (The yarn zigzags evenly.)

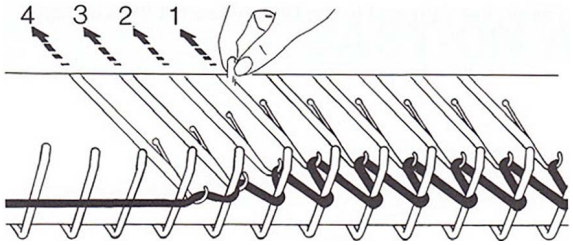


When knitting the first row, the loops may get smaller towards the edge.

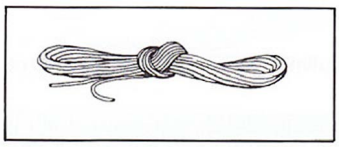
To achieve a successful cast-on, these smaller loops must be increased in size.



To correct, hold the yarn above the Yarn Feeder and pull it down to allow some slack.

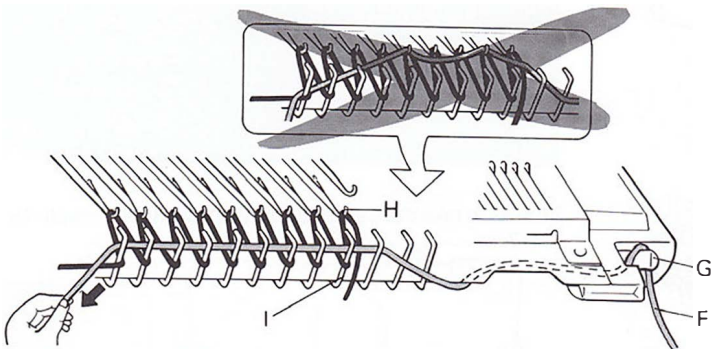


Starting with needle "1", push the needles with small loops one by one back to B position. (Always adjust from the inner needle.)



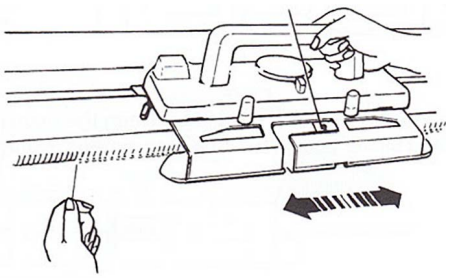
Take the Ravel Cord and undo it.
Make sure that there are no knots in the cord.

Do not overlook any smallest knot, or else the cord won't be pulled out of the knitting after casting on.



Place the end of the Ravel Cord "F" in the clip "G" at the right end of the Needle Bed as shown. Lay the Ravel Cord across the yarn loops between the needle hooks "H" and sinker posts "I".
Pull the Ravel Cord with the left hand.

Ensure that the Ravel Cord lies correctly across the loops and is not caught in the needle hooks.

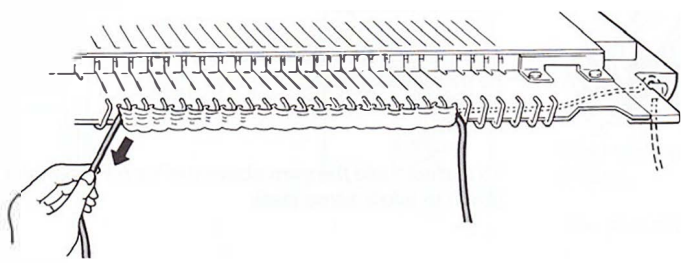


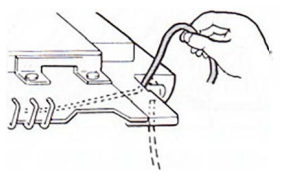
Pulling down the left end of the Ravel Cord, move the Carriage to the right.

Continue to knit 5 ~ 6 rows.

Release the Ravel Cord from the clip and pull it out from the left.

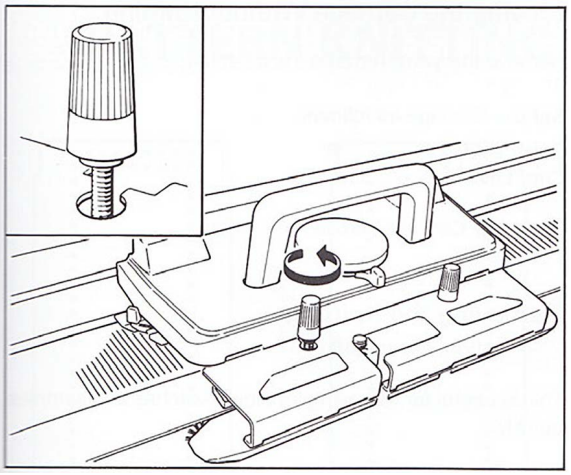
Cast-on has been finished.





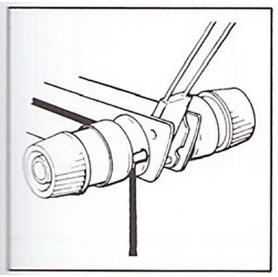
Knitting Stockinet

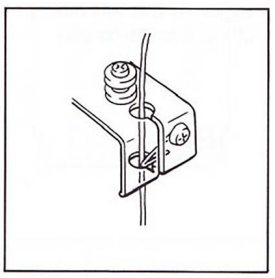
Remove the yarn end from the Clamp.
Hang the weights across the knitting.
Move the Carriage from side to side to knit Stockinet.



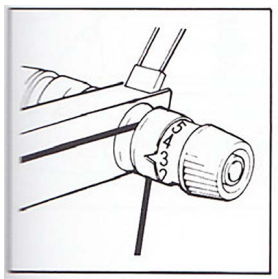
Check Points

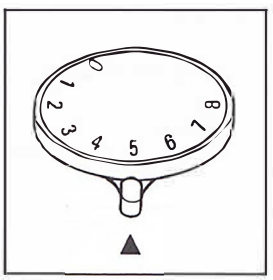
- Arm is attached to the Carriage correctly.



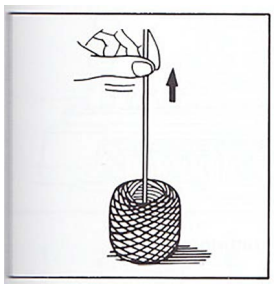


- Yarn is threaded correctly through the Auto Tension and Yarn Feeder.

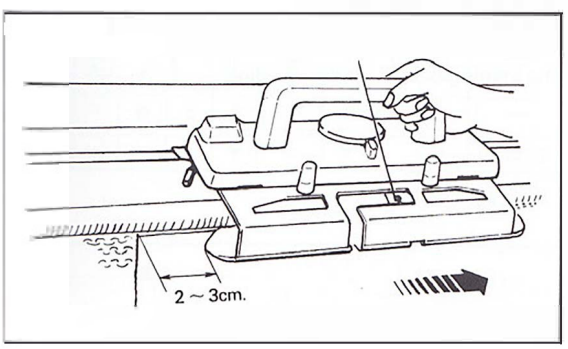




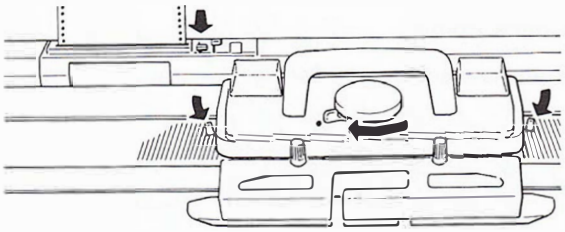
- Tension Dial, Stitch Dial and Cam Lever are set correctly.



- Yarn is wound correctly.
- Slack yarn is eliminated and Tension Spring is almost horizontal.



- Arm has passed the working needles by 2 ~ 3cm. before beginning the next row.



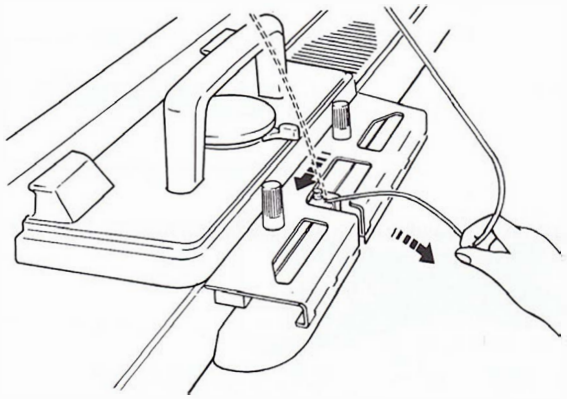
Moving the Carriage Without Knitting

Remove the yarn from the Yarn Feeder.

Set the Carriage as follows:

Side Levers..... ●
Cam Lever..... ⩚

Move the Carriage across the knitting.

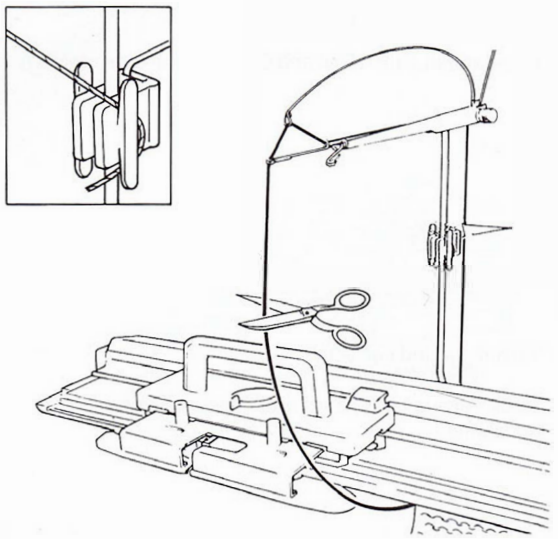


Removing the Knitting

— without casting off —

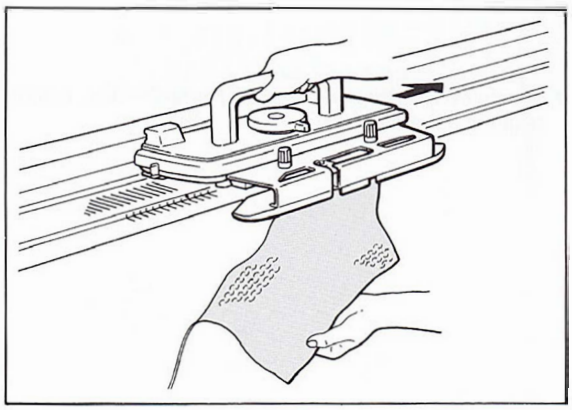
This is useful for removing tension swatches and samples quickly.

Move the Carriage a little to the right to move the Yarn Feeder to the left side of the Arm. Remove the yarn by pulling it towards you.



Hold the yarn between the Carriage and Tension Spring and cut it.

Place the yarn end into the Yarn Clip.

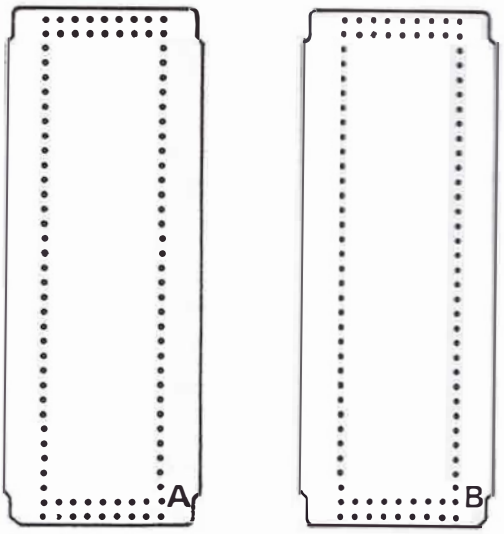


Remove the weights from the knitting.

Set the Cam Lever to Λ and move the Carriage across the knitting.

The knitting comes off the needles.

PATTERN KNITTING WITH LACE CARRIAGE



Standard Lace Punch Cards

10 Punch Cards numberd L-1 ~ L-10 are supplied with the Lace Carriage.

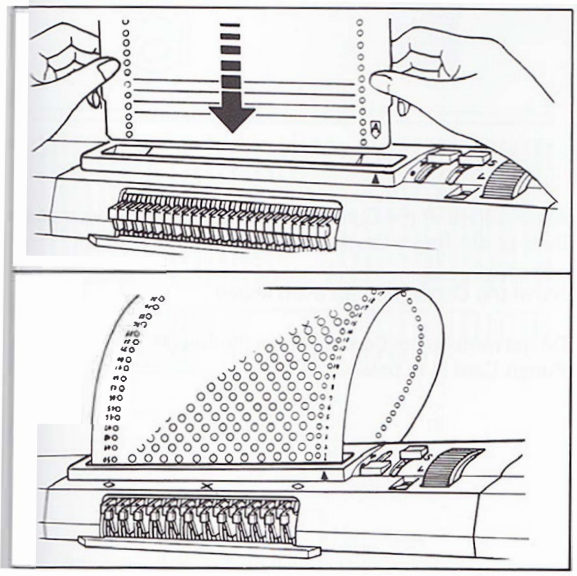
Punch Cards No. L-1 ~ L-8 are for plain lace.
Each Punch Card can be used in two ways and is marked "A" and "B".

"A" side is a basic pattern. If you use "B" side, you can get an effect of direction reversal.

Punch Card No. L-9 and L-10 are for fashion lace.
Only "A" side can be used.

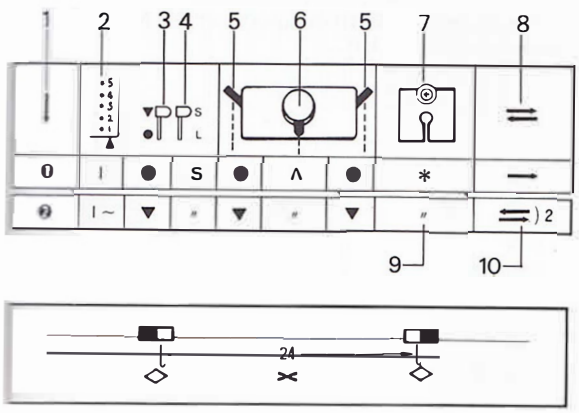
IMPORTANT!

Keep the Cards away from heat and direct sunlight.
Do not fold or bend the Cards.



Inserting Punch Card

See pages 18 ~ 19 for details.

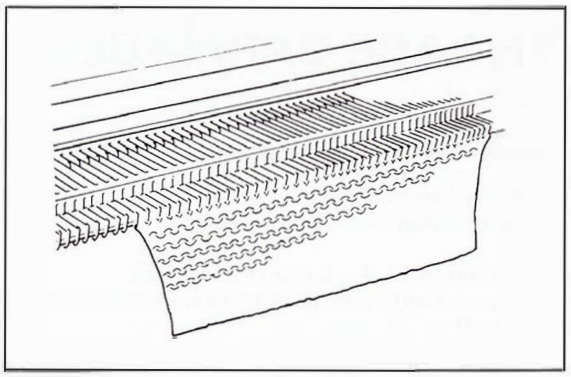


Reading Operation Table

1 — Order
2 — Pattern Row No.
3 — Stop Knob
4 — L Knob (Always set at "S" while lace knitting.)
5 — Side Levers
6 — Cam Lever
7 — Yarn Feeder
8 — Knitting Direction
9 — Yarn being used ("*" mark shows the yarn is in the Yarn Feeder.)
10 — Number of rows to be knitted

Point Cam M setting

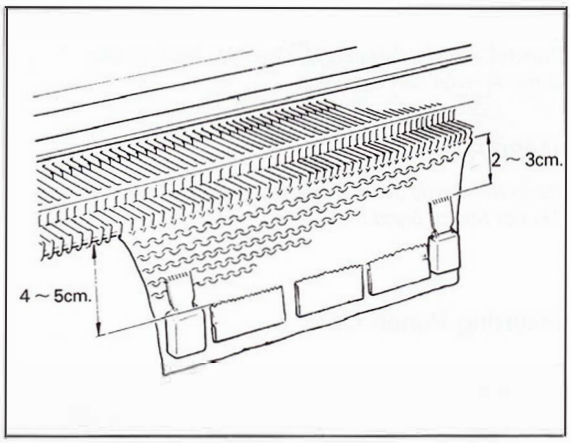
Place the Point Cams on the indicated position of the Needle Bed.
Figure on the Operation Table shows the number of needles between Point Cams.



Special Notes in Lace Knitting

Before beginning lace knitting, knit about 30 rows in Stockinet.

When you use A side of the Punch Card, place the Carriage at the left side of the Needle Bed to knit 1 row to memorize the pattern.

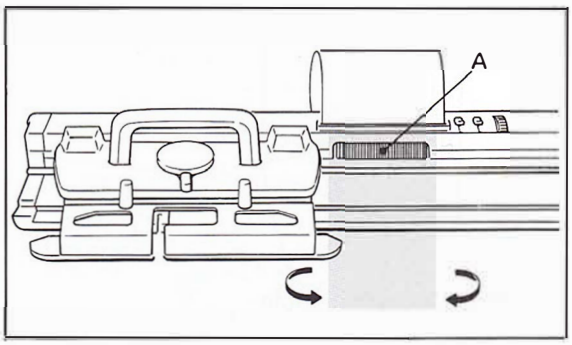


Hang the Wide Claw Weights across the knitting 4 ~ 5cm. down from the Needle Bed.

Hang the Claw Weights at both edges of the knitting 2 ~ 3cm. down from the Needle Bed.

Move the weights up as knitting progresses.

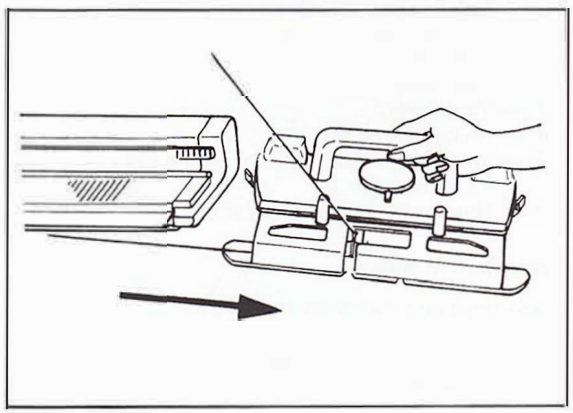
While lace knitting, always set the L Knob to ***S*** *and never to* ***L****.*



Make sure that the Carriage has passed the 24 needles in front of the Touch Levers "A".

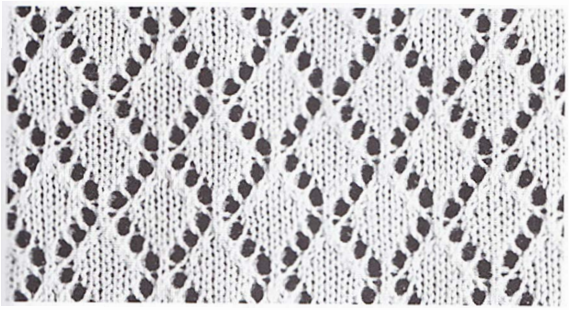
Move the Carriage at an even speed.

Do not remove the Carriage from the Needle Bed when the Punch Card is in use.



If the Carriage has been removed from the Needle Bed by accident, see page 101.

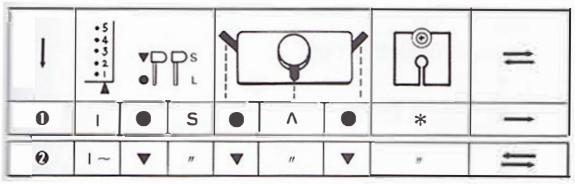
PLAIN LACE



The stitches are transferred by the Carriage during knitting.

The sample is knitted with Punch Card No. L-1-A.

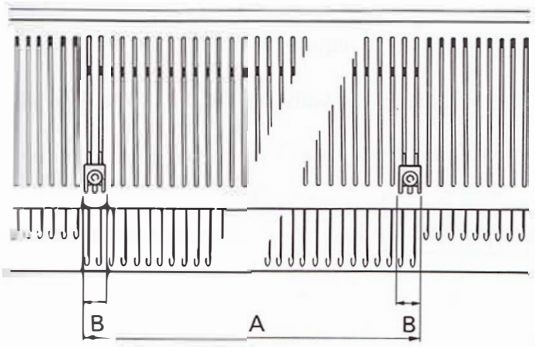
Use the Wide Claw Weights and Claw Weights.



Set the controls as required in ORDER ❶.

Knit 1 row from left to right.

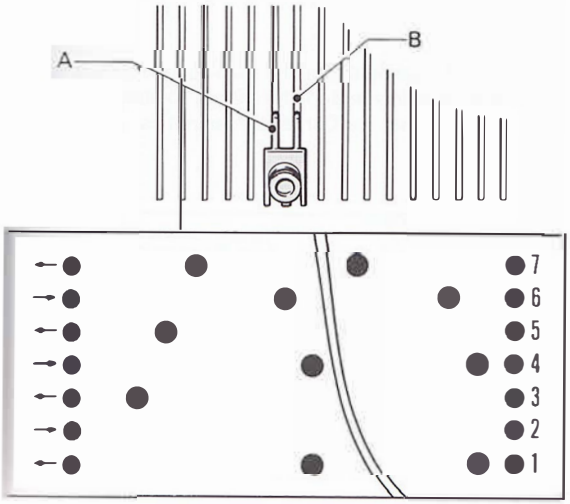
Take two Edge Pins.



Set the Edge Pins so that the knobs are between last two working needles at both edges of the knitting as illustrated opposite.

"A" — Needles knit lace pattern in B position.
"B" — Two needles always knit Stockinet.

When increasing or decreasing, move the Edge Pin to follow increased or decreased needles.



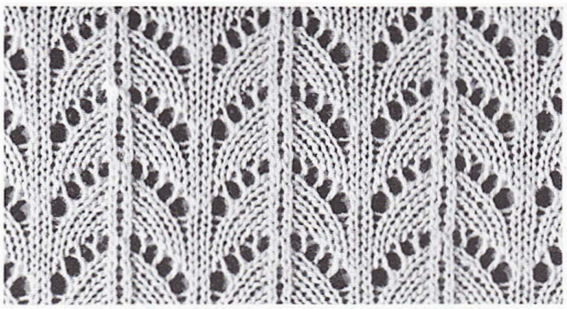
Ensure that the two studs "A" of the Edge Pin fit correctly into the needle slots "B", at the front of the Needle Bed.

Set the controls as required in ORDER ❷.

Knit the required number of rows.

Move the Carriage in the direction shown by arrow marks on the left side of the Punch Card.

FASHION LACE



To transfer stitches several times in each row or to transfer stitches in both directions in one row, move the Carriage to knit and transfer alternately.

The sample is knitted with Punch Card No. L-10-A.

Use the Wide Claw Weights and Claw Weights.

❶	1	●	S	●	∧	●	*	—
❷	1 ~ 2	▼	〃	▼	〃	▼	*	⇌) 2
	3 ~ 10	〃	〃	〃	⩓	〃		⇌) 8
❸	11 ~ 12	〃	〃	〃	∧	〃	*	⇌) 2
	13 ~ 18	〃	〃	〃	⩓	〃		⇌) 6
❹	19 ~ 20	〃	〃	〃	∧	〃	*	⇌) 2
	21 ~ 24	〃	〃	〃	⩓	〃		⇌) 4
❺	25 ~ 26	〃	〃	〃	∧	〃	*	⇌) 2
	27 ~ 28	〃	〃	〃	⩓	〃		⇌) 2

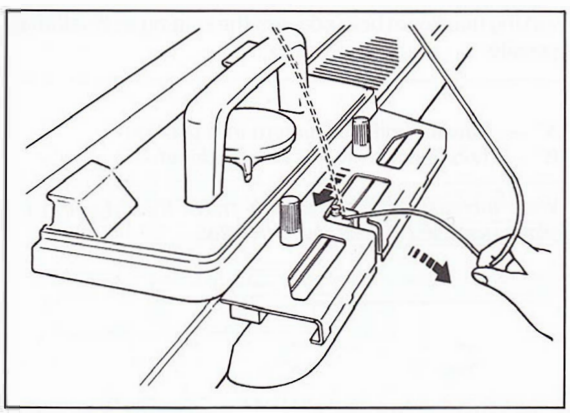
Set the controls as required in ORDER ❶.

Knit 1 row from left to right.

Set each Edge Pin over end two working needles.
(See page 94)

When increasing or decreasing, move the Edge Pin to follow increased or decreased needles.

"*" mark shows the yarn is in the Yarn Feeder.

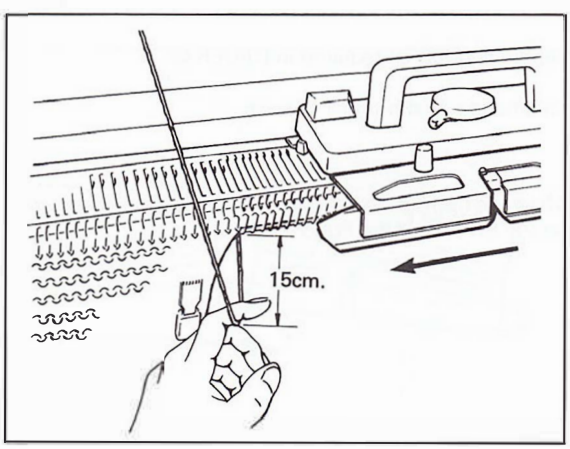


Set the controls as required in ORDER ❷.

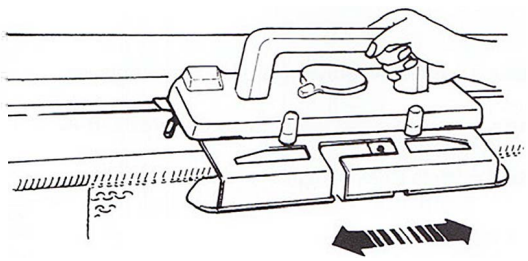
Knit 2 rows, finishing with the Carriage at the right side.

Set the Cam Lever to ⩓.

Remove the yarn from the Yarn Feeder by pulling it towards you.

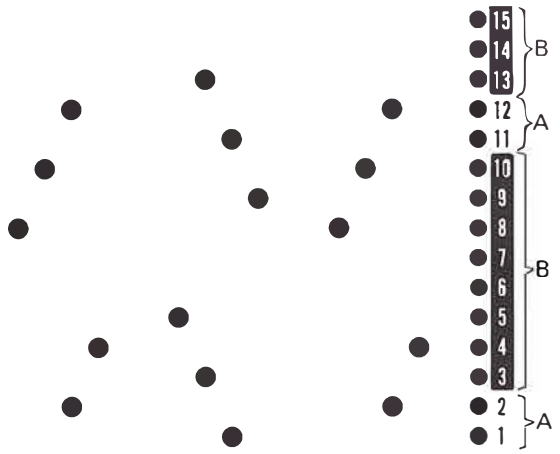


With the left forefinger, pull the yarn approximately 15cm. down from the Needle Bed and slightly towards you, leaving a space so that the Carriage does not catch the yarn.



Move the Carriage 8 times over the marked Pattern Row Numbers 3 ~ 10 (numbers in the dark box), finishing with the Carriage at the right side.

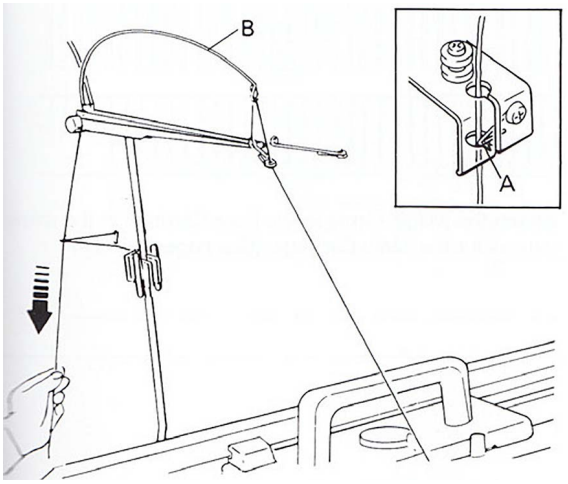
During this, the Carriage does not knit but transfers stitches to their adjacent needles.



Reading Pattern Row Numbers

A — On these rows, the Carriage knits Stockinet.
Thread the yarn into the Yarn Feeder and set the Cam Lever to Λ.

B — On these rows, the Carriage only transfers stitches, and does not knit.
Remove the yarn from the Yarn Feeder and set the Cam Lever to ⩚.



Replace the yarn in the Yarn Feeder.

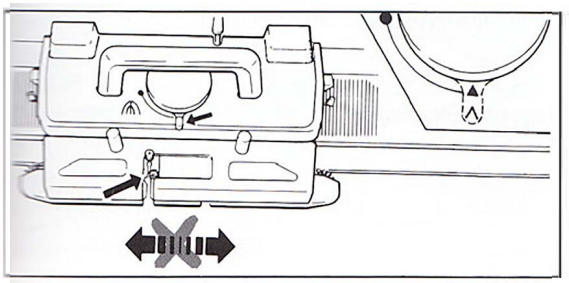
Yarn must be behind the Guide Pin "A".

Eliminate slack yarn by pulling the yarn down at the back of the Yarn Rod until Tension Spring "B" is almost horizontal.

Set the Cam Lever to Λ as required in ORDER ❸.

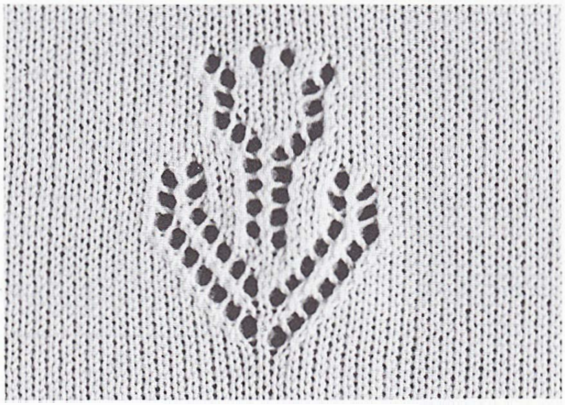
Knit 2 rows over the Pattern Row Numbers 11 ~ 12.

From the marked Pattern Row Number 13, knit the required number of rows following the instructions for "Reading Pattern Row Numbers" shown above.



Do not move the Carriage without yarn in Yarn Feeder while the Cam Lever is at Λ, or the fabric will drop from the machine.

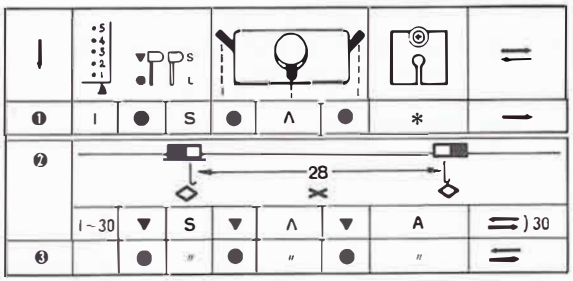
SINGLE MOTIF



Make a pattern wherever you like on the knitting.

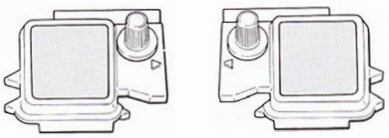
The sample is knitted with Punch Card No. L-8-A.

Use the Wide Claw Weights and Claw Weights.

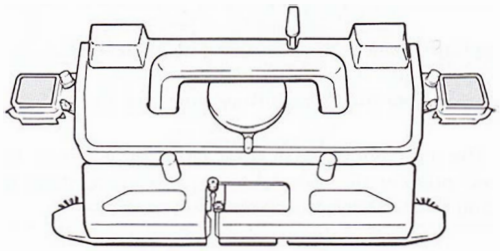


Set the controls as required in ORDER ❶.

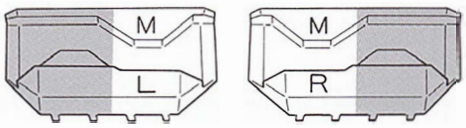
Knit 1 row from left to right.



Take the left and right Magic Cams.



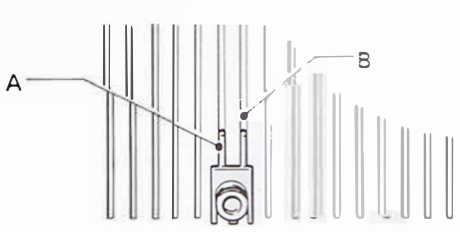
Attach the Magic Cams to the Lace Carriage in the same way as for the Main Carriage. (See pages 23~24)



Take the left and right Point Cams.

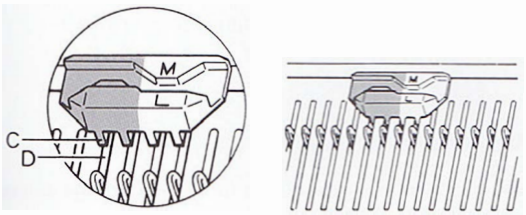
Point Cam M (Left) — marked M, L
Point Cam M (Right) — marked M, R

Take two Edge Pins.



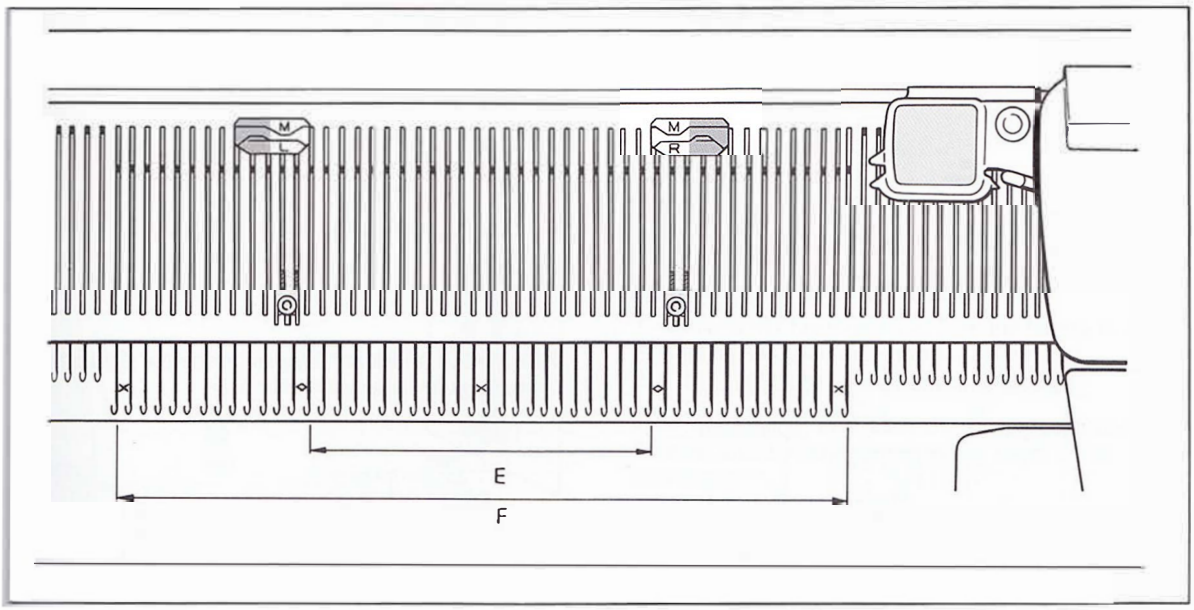
Set the Edge Pins so that the knobs are between the first and second needles adjacent to the last needles knitting Single Motif. (In this sample, the 13th and 14th needles)

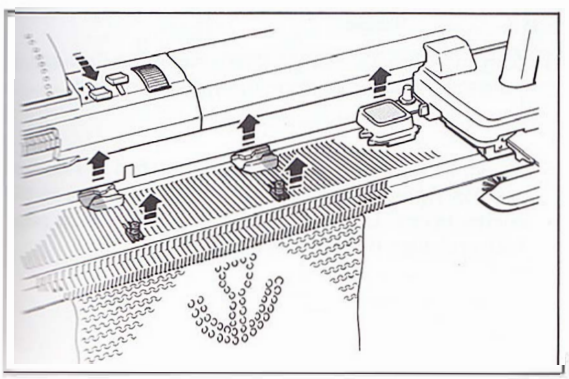
Ensure that the two studs "A" of the Edge Pin fit correctly into the needle slots "B", at the front of the Needle Bed.



Set the left and right Point Cams with their divisions (orange and white) between the second and third needles adjacent to the last needles knitting Single Motif, i.e. adjacent to each Edge Pin. (In this sample, the 14th and 15th needles)

Ensure that the four studs "C" of the Point Cam fit correctly into the needle slots "D", at the back of the Needle Bed.





Edge Pins and Point Cams must be positioned as shown above.

"E" — Single Motif Section
"F" — Knitting Width

Set the controls as required in ORDER ❷.

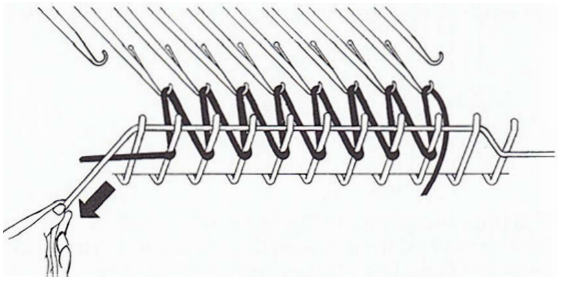
Knit 30 rows in Single Motif.

After the Single Motif has been finished, remove the Magic Cams, Point Cams and Edge Pins.

Set the controls as required in ORDER ❸.

Side Levers..... ●
Stop Knob..... ●

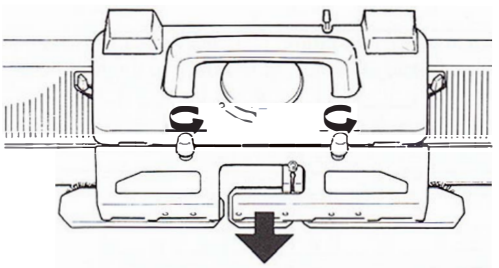
Continue knitting in Stockinet.



If cast-on row has not been knitted...

Ensure that the Stitch Dial is set to approximately 6 for the first row. This setting makes large loops between sinker posts and needle hooks, allowing you to lay the Ravel Cord straight on the zigzag. Pull the Ravel Cord firmly before you move the Carriage.

Pull out the Ravel Cord after knitting 6 ~ 7 rows.



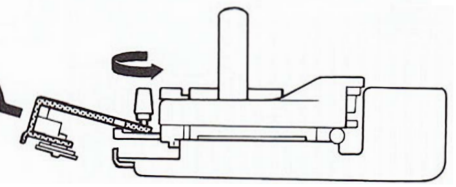
If the Carriage has jammed...

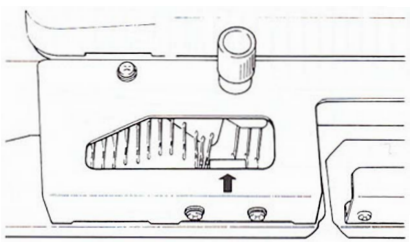
In the middle of the row, do not force the Carriage across the Needle Bed. Proceed as follows:

In pattern knitting, set the Stop Knob to ● and remove the Magic Cams if they are in use, before moving the Carriage.

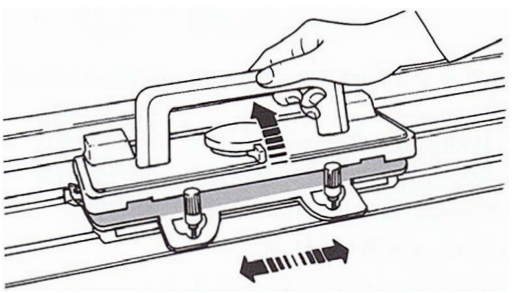
1. Remove the yarn from the Yarn Feeder.

2. Loosen the Arm Nuts and remove the Arm.



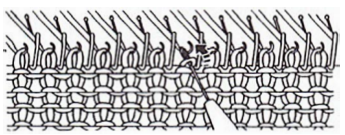


If the needle hooks are jammed inside the Arm, remove them carefully using a Transfer Tool.

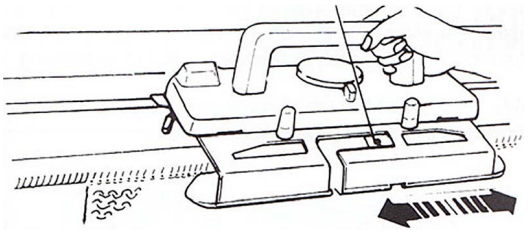


3. Set the Carriage as follows:
   Cam Lever..... ⋒
   Side Levers..... ●

4. With the Carriage Handle lifted, move the Carriage in the same direction to clear the working needles.



5. If stitches have slipped behind the latches of needles, use the Transfer Tool to replace these stitches in the needle hooks. Unravel the knitted stitches (see page 100) and align the needles in B position.



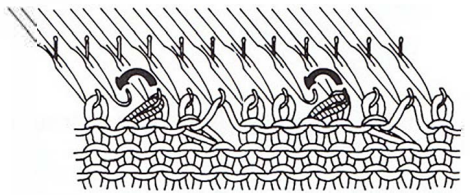
6. Move the Carriage without knitting to the same side as the yarn.

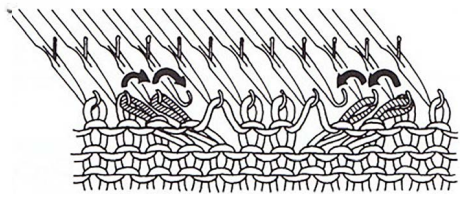
   If the Punch Card is in use, memorize the pattern with the Carriage, with the Stop Knob at ●. (See pages 100 ~ 101)

7. Reset the controls, and replace the Arm.

   Cam Lever.....original position
   Side Levers..... original position
   Stop Knob..... ▼
   Replace Magic Cams if in use.

8. Replace the yarn in the Yarn Feeder and continue knitting.

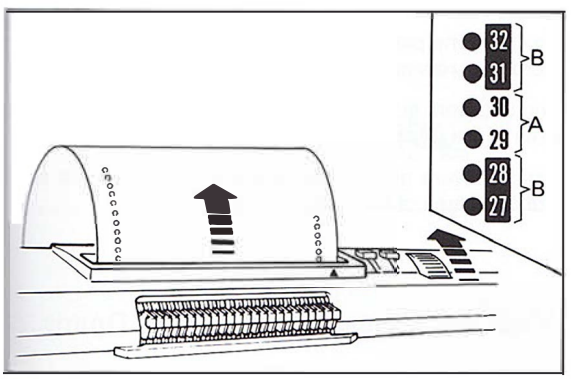


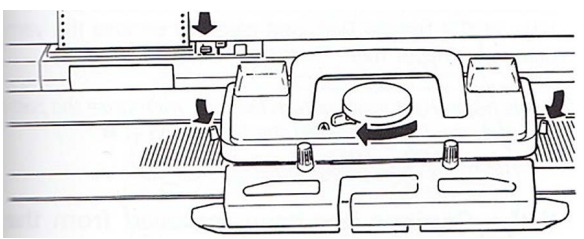


To Unravel the Knitting on the Machine

Unravel the stitches knitted in Stockinet referring to the instructions for Main Carriage on page 36, and replace the transferred stitches on their original needles before unravelling the row.

If using a Punch Card, wind back the Card and memorize the pattern with the Carriage, with the Stop Knob at ●. (See pages 100 ~ 101)





To Memorize the Pattern

Memorizing the pattern is required when:

1. Carriage has been removed from the Needle Bed.
2. Knitting has been unravelled.
3. Yarn is entangled in Memory Drums.

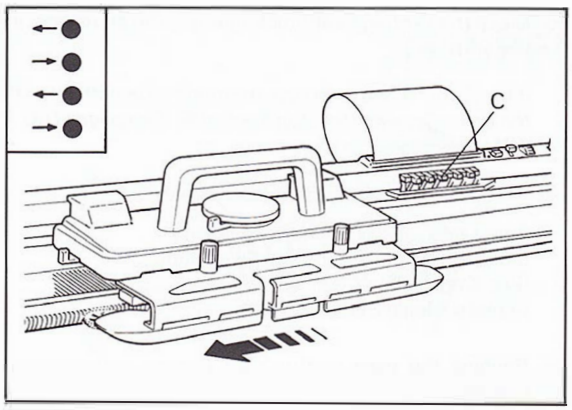
After unravelling, turn back the Punch Card and Row Counter by the same number of rows as you have unravelled.

When the Punch Card for Fashion Lace (L-9 and L-10) is in use, return the Card by the same number unravelled, counting only the Pattern Row Numbers "A" skipping the marked Pattern Row Numbers "B".
"B" sections are not knitted rows, but rows for transferring stitches.

Set the controls as follows:

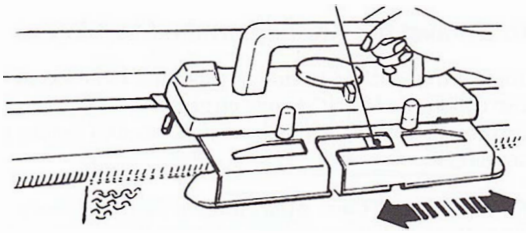
Stop Knob..... ●
Cam Lever.....
Side Levers..... ●

Remove the yarn from the Yarn Feeder.



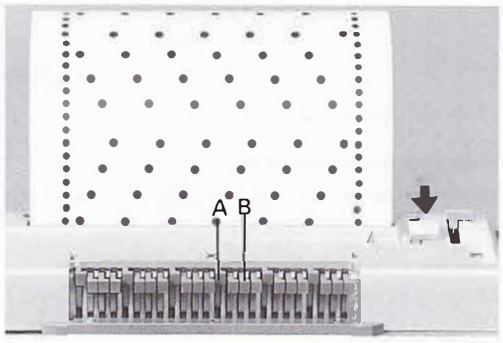
Move the Carriage once or twice across the Needle Bed until it has passed the 24 needles in front of the Touch Levers "C" and finish at the yarn side of the knitting.

Make sure that the arrow mark on the Punch Card corresponds to the knitting direction.



Replace the yarn in the Yarn Feeder and reset the controls to their original position.

Continue to knit.



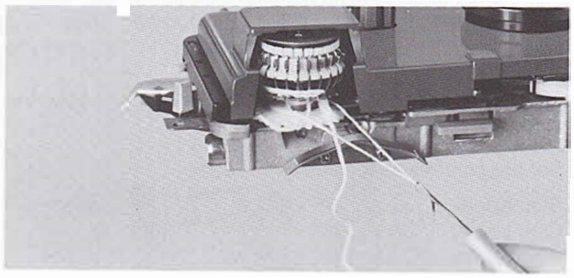
To Check the Pattern With the Card

By setting the Stop Knob to ●, the pattern of the row to be knitted next is shown by the Touch Levers.

To check the pattern on the previous row, wind back the Card by 1 row and set the Stop Knob to ●.

Touch Levers at the back position "A" show the punched area of the Card.

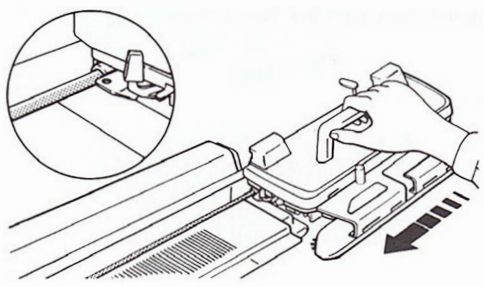
Touch Levers at the front position "B" show the non-punched area of the Card.



If the yarn is entangled in Memory Drums...

If the yarn gets entangled inside the Memory Drums, move the Carriage to the side until the defective drum is off the edge of the Needle Bed, and carefully remove the yarn using the Tappet Tool.

If this happens during pattern knitting, memorize the pattern with the Carriage, with the Stop Knob at ●.
(See pages 100 ~ 101)



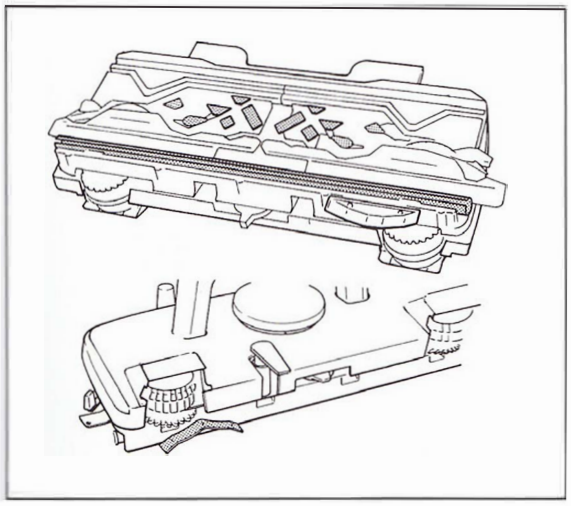
If the Carriage has been removed from the Needle Bed...

Replace the Carriage on the Needle Bed by sliding the Carriage Pipe onto the rail.

Make sure that the Carriage moves smoothly across the Needle Bed.

If the Punch Card is in use, memorize the pattern with the Carriage, with the Stop Knob at ●.
(See pages 100 ~ 101)

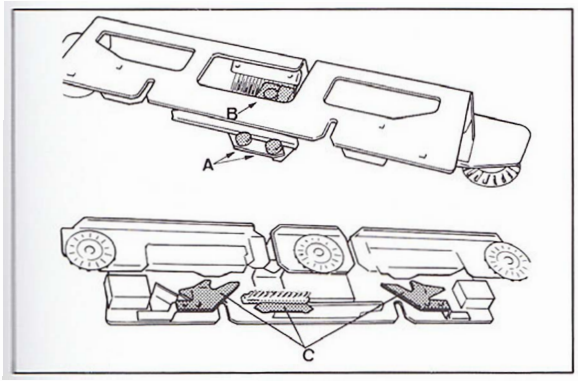
MAINTENANCE



Carriage

Remove the Arm from the Carriage.

Turn over the Carriage and brush off all fluff. Oil the metal parts, Carriage pipe and slider with a soft, oiled cloth.



Arm

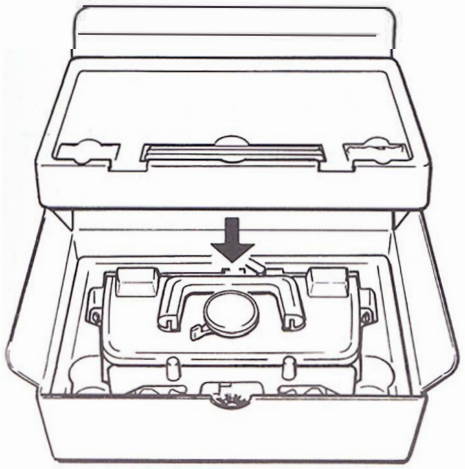
Remove any fluff from the rollers "A" and Yarn Feeder "B". Oil the metal parts at the back of the Arm with a soft, oiled cloth.

The metal parts "C" of the Lace Arm must be handled very carefully.

IMPORTANT!

Do not apply oil straight from the bottle.

REPACKING



Attach the Arm to the Carriage.

Replace the Carriage into the styrofoam packing.

Lay the Carriage Handle down.

Replace the accessories into the upper styrofoarm packing and place over the Carriage.